LUMMI NATION

WETLAND INVENTORY UPDATE
YEAR 2 SYNTHESIS REPORT
2006

December 2006

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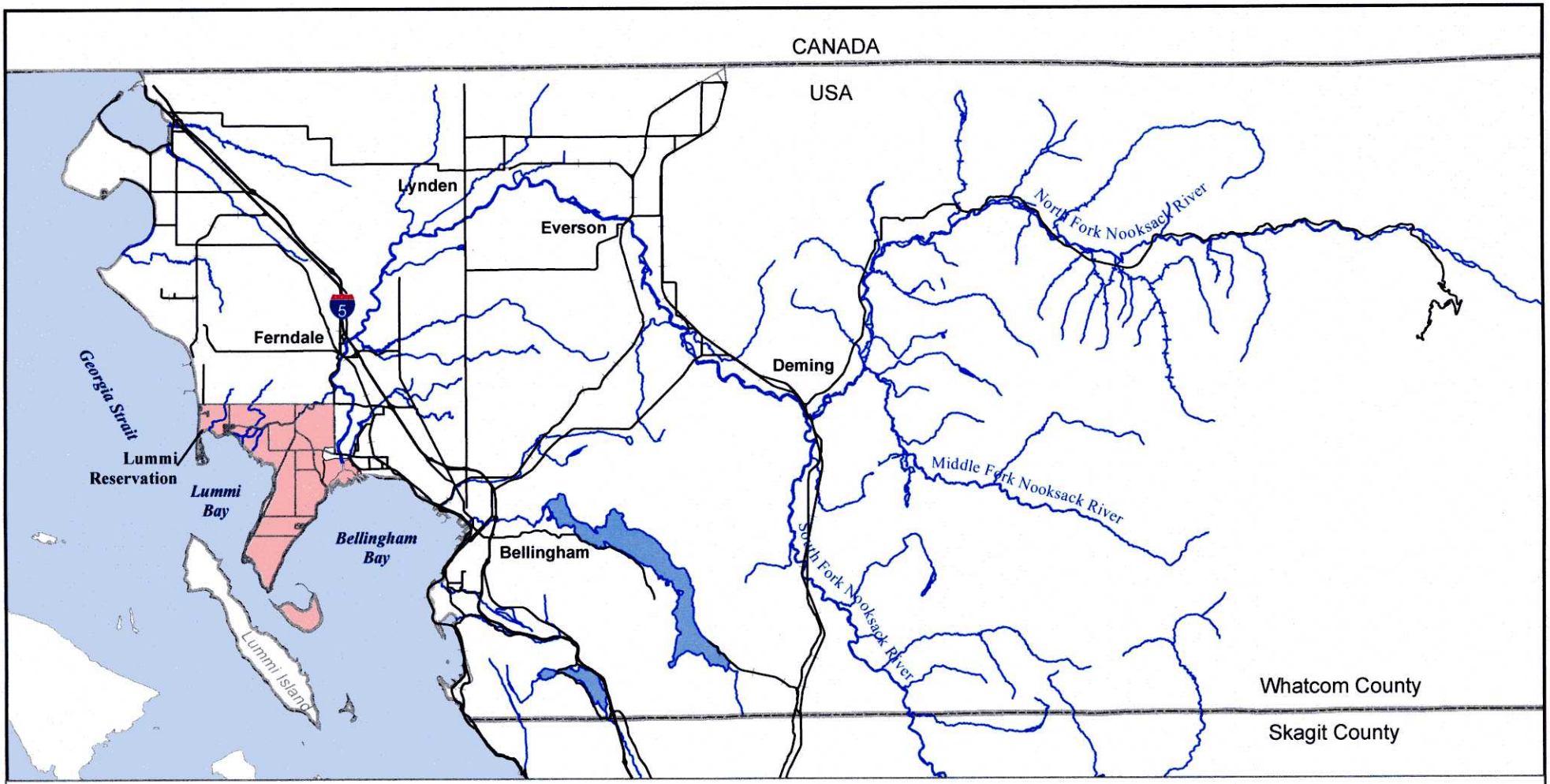
1. BACKGROUND/INTRODUCTION

The Lummi Indian Reservation (Reservation, see Figure 1) is located along the western boundary of Whatcom County, Washington and includes the mouth of the Nooksack and Lummi rivers. Both the Nooksack and Lummi river watersheds are under environmental pressures from rapid regional growth. The Lummi Nation has also entered a period of rapid economic development under self-governance. Growth on and near the Reservation requires that the Nation's core environmental program prioritize the development of a regulatory infrastructure that allows for responsible growth while protecting tribal resources and the Reservation environment. This regulatory infrastructure supports both the tribal goal and the Environmental Protection Agency (EPA) policy of tribal self-governance and recognition of sovereignty.

Previous EPA and other funding sources have supported the Lummi Nation's assessment of priority water resource needs and the identification of unmet needs. Environmental planning intended to protect the Nation's water resources has included development of a Storm Water Management Program (LWRD 1998), a Wellhead Protection Program (LWRD 1997, LWRD 1998), a Wetland Management Program (LWRD 2000), a Non-Point Source Management Program (LWRD 2001, LWRD 2002), and draft Water Quality Standards for surface waters (LWRD 2006). These programs are components of a comprehensive water resources management program (CWRMP) being developed and implemented pursuant to Lummi Indian Business Council (LIBC) resolutions No. 90-88 and No. 92-43.

In January 2004, the Lummi Nation Water Resources Protection Code (Title 17 of the Lummi Code of Laws [LCL]) was adopted. Based on a Reservation-wide wetland inventory completed in 1999 (Harper 1999) and as described in Chapter 17.06 (Stream and Wetland Management) of the Code, different types of wetlands that vary in their quality and importance occur on the Reservation. In order to establish appropriate levels of protection, pursuant to LCL Chapter 17.06 the Reservation wetlands must be classified into one of four categories. Category 1 wetlands are considered Critical Value Wetlands that have a high and irreplaceable level of importance for fisheries, Lummi culture, and/or water quality on the Reservation. Category 4 wetlands have minimum habitat value and are suitable for restoration or enhancement efforts.

The purpose of the 1999 Reservation-wide wetland inventory was to identify wetland locations and to collect information on the characteristics and functions of the Reservation wetlands. The 1999 Reservation-wide wetland inventory (Harper 1999) relied largely on remotely sensed data (i.e., color and infra-red aerial photographs), generalized mapping (i.e., USDA soil survey), and limited field verification to identify wetland locations and sizes. In addition to identification and mapping, the 1999 inventory collected general wetland information including Cowardin classification (Cowardin et al. 1979),



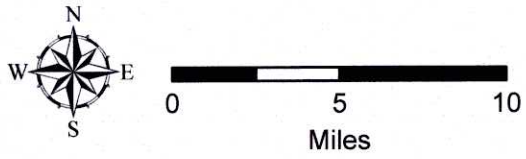


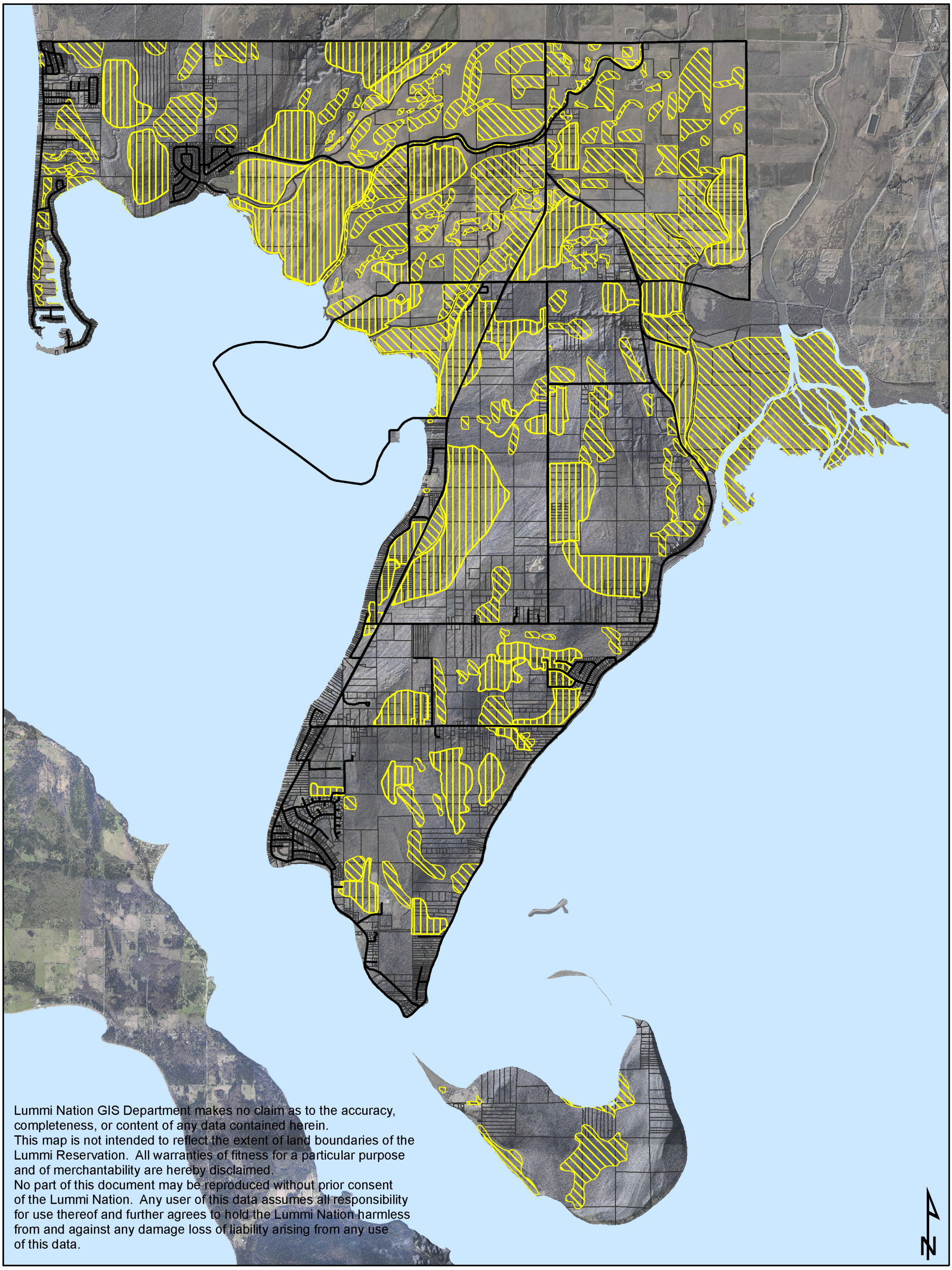
Figure 1 - Regional Location of the Lummi Indian Reservation, Washington

water source, and soil type. The Washington State Function Assessment Method was applied to twelve (12) assessment units (AUs) in nine (9) selected wetlands on the Reservation. The 1999 inventory identified and mapped a total of 214 wetlands and wetland complexes on the Reservation (Figure 2). These wetland areas totaled 5,432 acres, or roughly 43 percent of the land area of the Reservation, excluding tidelands. Approximately 60 percent of these mapped wetland areas are located in the flood plains of the Lummi and Nooksack rivers.

Although the 1999 inventory represents an important planning tool and a significant improvement over the previously available information, which was largely from the National Wetlands Inventory (USFWS 1987), the 1999 inventory has proven to be too general for more detailed level planning efforts. The 1999 inventory either did not map some wetlands or generally shows larger wetland areas than are surveyed in the field or identified using Global Positioning System (GPS) technology. Refining the spatial resolution of the wetland mapping, performing function assessments, and classifying the wetlands into the regulatory categories identified in Title 17 is intended to support efforts to protect these wetland resources and the important ecological, hydrological, and water quality protection functions that they provide. Because of the large number of wetland areas on the Reservation, the effort to refine the spatial resolution of the wetland mapping, to perform function assessments, and to classify the Reservation wetlands is projected to require several years to complete. This report summarizes the results of the second year of this inventory update effort.

For the purposes of this inventory update, a wetland evaluation consists of conducting site visit(s), performing at least a reconnaissance level delineation, using the GPS to map the identified wetland boundaries, performing a function assessment largely using the Washington State Wetland Function Assessment Project (Hruby et al. 1999) methodology, and classifying the wetlands into one of four categories. Pursuant to Hruby (1999), only one function assessment was conducted if the wetland being categorized met the definition of a mosaic of wetlands or met other criteria of wetlands with several classes or subclasses. This approach to identifying function assessment units resulted in the evaluation of thirty-five (35) wetlands during this second year of the inventory update (approximately 16 percent of the total number of wetlands identified during the 1999 inventory). When combined with the wetlands identified last year, seventy-one (71) wetlands (approximately 33 percent) of the Reservation wetlands have been evaluated. Based on this experience and assuming the same evaluation rate, approximately four more years will be required to complete an evaluation of all of the Reservation wetlands.

Figure 2 - 1999 Wetland Inventory Results



This Year 2 wetland inventory update synthesis report is divided into the following sections:

- Section 1 is this background/introduction section.
- Section 2 describes the methods used to conduct the mapping, function assessments, and categorization of Reservation wetlands.
- Section 3 summarizes the results of Year 2 of the wetland inventory update.
- Section 4 provides a discussion of the second year results.
- Section 5 lists the references cited in the report.

Appendix A contains a map of each wetland mapped during the second year of the inventory update. The results from Year 1 are summarized in a similar synthesis report (LWRD 2005). The field notes and function assessment worksheets for each wetland are on file with the Lummi Water Resources Division. In Appendix B, an example of the field notes and function assessment worksheets completed for each wetland is provided.

2. METHODS FOR WETLAND INVENTORY UPDATE

The methods used to update and refine the spatial resolution of the 1999 Inventory are described below. Ms. Lee First, a Water Resources Planner II in the Lummi Water Resources Division, applied the described methods. Ms. First is a Professional Wetland Scientist (PWS), has a Professional Certificate in Wetlands Science and Management (University of Washington 2001), and a Bachelors of Science in Environmental Studies (Western Washington University 1987). Ms. First also received additional training from the consulting firm Sheldon & Associates and from the Washington State Department of Ecology. Sheldon & Associates conducted a training session in the application of the Methods of Assessing Wetland Functions in July 2003 and Dr. Tom Hruby (Senior Ecologist, Washington State Department of Ecology) conducted two training sessions on the application of the *Revised Washington State Wetland Rating System in Western Washington* during May and August 2005. Field data were collected for the results summarized in this update from November 2005 through December 2006.

Five inter-related methods were used to update and refine the 1999 inventory. The different methods were used for wetland mapping/boundary determination, for wetland function assessment, for wetland rating/classification, for updating the Lummi Nation GIS wetland inventory/database, and for quality control.

2.1 Method for Wetland Mapping/Boundary Determination

Because of property access issues, and the remoteness and size of some of the Reservation wetlands, it was not practical to undertake a geography-based approach (i.e., watershed by watershed) to selecting the wetlands evaluated during this study. Instead, the locations of the wetlands evaluated during this inventory update were based on areas where property was considered for purchase by the LIBC, development actions were contemplated, and/or on parcels for which Lummi Land Use Permit Applications were submitted to the Lummi Planning Department. In several areas, small and moderate sized wetland areas were discovered that had not been identified in the 1999 inventory.

During the planning stages for this update effort, it was estimated that approximately 70 wetlands could be evaluated during one year (approximately three days per wetland). This estimate proved to be overly optimistic due to a number of factors including property access issues and the remoteness and size of some of the wetlands. There were also seasonal considerations including long periods of flooding, frozen ground, and snow that limited and/or prevented wetland boundary determination during portions of the winter season. During the summer season, mapping forested wetland areas was problematic because GPS satellite signals were often difficult to obtain through the dense tree canopy. Of the 214 wetlands on the Reservation that were mapped during the 1999 inventory, thirty-seven (37) wetland areas were field verified and mapped during

this Year 2 effort. Function assessments were conducted and ratings/classifications were performed on thirty-five (35) wetland areas during Year 2 of this inventory update effort (approximately 16 percent of the total number of inventoried wetlands). In several cases these function assessment units were a mosaic of wetlands that were in close proximity to each other. Although separate wetland boundaries exist within some of these wetland mosaics, they were considered as one assessment unit due to their similar characteristics and/or connectedness in the landscape. Only one function assessment was conducted if the wetland being categorized met the definition of a mosaic of wetlands or met other criteria of wetlands with several classes or subclasses (Hruby 1999).

In several cases, development actions were planned on a parcel of land where the 1999 inventory indicated that large wetlands or wetland complexes were located over contiguous parcels. Because acquiring landowner permission is time consuming – particularly for undivided parcels in trust status that may have in excess of 100 landowners, in many cases only a portion of the wetland boundary on the particular parcel where the development action was planned was mapped. As a result, there are several wetlands and numerous fragments of wetlands that have been mapped by Water Resources staff during the last several years. These areas are mapped or partially mapped and appear in Figure 3, Figure 4, and Appendix A. Work is in progress on these areas, and function assessments and classification/ratings have not yet been performed yet due to time constraints, adverse weather, and/or other reasons. These areas have been archived in GIS so that work can continue on these wetlands and mapping, function assessments, and categorization can be finalized in the future as this wetland inventory update is completed.

Boundaries were identified for two wetland areas (38N1E25-04 and 38N1E04-06) during this Year 2 effort, but function assessments and ratings were not performed. As a result, these wetlands are listed on Table 1, but are not included in Tables 2 or 3, which respectively summarize the function assessment and rating results. Function assessments and ratings for these wetlands will be performed in 2007.

Once a wetland from the 1999 inventory or a land parcel was selected for evaluation, the methodology used to reliably identify and map the wetland boundaries was the following:

1. Prior to conducting a field visit, available remotely sensed data including high resolution aerial photography collected during 2004 and high-resolution (approximately 0.5 feet accuracy) topographic information acquired in 2005 using Light Detection and Ranging (LIDAR) technology were reviewed. Maps developed as part of the USDA soil survey for the area (USDA 1992) were also reviewed.
2. Information developed during the 1999 wetland inventory, including watershed name and size, wetland size, Cowardin classes present,

association with streams or other water resources, and USDA soil units in the vicinity was reviewed.

3. During the field visit(s), one of the following two methods for determining wetland boundaries were used:
   - If development activities were planned that would potentially impact wetlands, or a jurisdictional determination of the wetland boundary was required, the wetland boundary was determined in the field using the criteria and methodology of the Wetland Delineation Manual (Manual) issued by the U.S. Army Corps of Engineers (COE 1987). This manual requires examination of three parameters: vegetation, soils, and hydrology. For an area to be classified as a wetland, hydrophytic vegetation, hydric soils, and wetland hydrology must be exhibited. The specified criteria are mandatory and must all be present, except under circumstances when a wetland is considered a disturbed area or a problem wetland. Once delineated, the wetland boundaries were recorded using a handheld Trimble GeoXT GPS unit, and downloaded into ArcMap9 GIS software. The horizontal accuracy of the Trimble GeoXT is $\pm$ 2 feet once the collected data are post-processed.
   - If development activities were not planned, and or other conditions made locating the boundary difficult (i.e., lack of satellite configuration for the GPS unit, lack of permission to access property, or other reason), a "reconnaissance-level" boundary determination was made instead of a jurisdictional determination. Much more time would have been required if jurisdictional determinations were made on all the wetlands because wetland data plots along regularly spaced transects would have been required. For the reconnaissance-level of determination, the same criteria were applied, but in a less formal manner, or in some cases, only a portion of the wetland edge was recorded using a GPS unit, and the rest of the wetland boundary estimated using a combination of other methods (i.e., aerial photography and LIDAR). In some cases, portions of the wetland boundaries were recorded using a combination of an on-the-ground reconnaissance, GPS data, soil mapping, LIDAR data, and recent aerial photography.

2.2 Method for Wetland Function Assessment

The *Methods for Assessing Wetland Functions, Volume 1* by the Washington State Wetland Function Assessment Project (Hruby et al. 1999) were used to assess functions of wetlands on the Lummi Reservation. The Washington State Method (commonly called WAFAM) is based on the nationally recognized Hydrogeomorphic (HGM) approach (Brinson 1993), which classifies wetlands based on landscape position and water regime, and provides guidance on arriving at technical assumptions on which assessments of performance of functions are based. The HGM method proposes the following classes of wetlands: Depressional, Fringe, Slope, Riverine, and Flats (Brinson 1993).

The Washington State technical committee has thus far developed assessment methods only for depressional and riverine wetlands. Most of the wetlands on the Lummi Reservation fall into these two categories, although estuarine fringe and flats are also clearly present. One wetland identified during 2006 was an estuarine wetland (38N1E14-05). Because the WAFAM method has not been developed for Fringe wetlands, no function assessment was done at this time for wetland 38N1E14-05.

The Washington State approach (Hruby et al. 1999) relies on indicators of functions to assess potential performance, rather than direct measurements. Indicators are usually physical characteristics of the wetland or its surrounding area that can be correlated to a specific function. For example, rather than trying to directly sample aquatic mammals, the presence of steep banks in the wetland can be used as an indicator of the suitability of the wetland habitat for aquatic mammals. After collecting detailed data on indicators, mechanistic models (mathematical equations) are applied to the data to arrive at a numeric indexed score. This step is based on the assumption that the relationship between indicators and the actual performance level for a function can be defined by a simple mathematical expression. Different models were developed for each subclass of wetland and for each function category (Hruby et al. 1999).

The first step in assessing wetland functions is to divide the wetland into an assessment unit (AU). Wetlands are divided into AUs based on differences in water regime. The AU boundary occurs where the volume, flow, or velocity of the water changes rapidly, whether created by natural or artificial features. An entire wetland may be uniform in its water regime and would therefore be comprised of a single AU.

As noted above, the WAFAM method relies on indicators of functions to assess potential performance rather than direct measurements. A total of fifteen (15) categories of functions are assessed for each wetland under the WAFAM method. The indices that result for each wetland function represent an assessment of performance relative to reference standard wetlands identified as having the highest level of performance within that wetland subclass.

The index of performance reflects the level of performance per unit area of the wetland being assessed. Another calculation must be made to factor in the size of the assessment unit to get a final performance index for that function of a particular assessment unit. The index denotes the assessed potential performance or habitat suitability based on the structural characteristic present in and around the assessment unit. The index does not denote the actual performance, as that would require detailed monitoring. It is assumed that the assessment unit will perform the function if the appropriate structural components are present and if the opportunity exists. A low index (i.e., 1,2,3) for a function does not necessarily mean the wetland is “unimportant.” It may be the only wetland in the area providing certain functions.

2.3 Method for Wetland Rating/Classification

There is currently no tribal or federal rating system to categorize wetlands based on functions and values. As a result, the Washington State Department of Ecology's *Wetland Rating System for Western Washington – Revised* (Hruby 2004) was used to classify Reservation wetlands according to the Washington State Department of Ecology's Wetland Rating System. This document is a revision of the *Washington State Wetland Rating System for Western Washington,* published by the Department of Ecology in 1991. For this Year 2 effort, the revised version was used for all wetlands inventoried.

The current version of the wetland classification system was designed to differentiate between wetlands based on their sensitivity to disturbance, their significance, their rarity, the ability to replace them, and the functions they provide. The classification system results in rating wetlands into one of the following four categories:

- Category 1 wetlands are those that represent a unique or rare wetland type, or are more sensitive to disturbance than most wetlands, or are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime, or provide a high level of functions (scores > 70 points).
- Category 2 wetlands are difficult, though not impossible to replace, and provide high levels of some functions (scores between 51 – 69 points). These wetlands occur more commonly than Category 1 wetlands, but still need a relatively high level of protection.
- Category 3 wetlands are wetlands with a moderate level of functions (scores between 30 – 50 points). They have been disturbed in some ways, and are often less diverse or more isolated from other natural resources in the landscape than Category 2 wetlands.
- Category 4 wetlands have the lowest levels of functions (scores less than 30 points) and are often heavily disturbed. These are wetlands that could be replaced, and in some cases, improved. These wetlands may provide some important ecological functions, and also need to be protected.

The rating categories are intended as the basis for developing standards for protecting and managing the wetlands to reduce further loss of their value as a resource. Some decisions that can be made based on the rating include the width of buffers needed to protect the wetland from adjacent development, the ratios needed to compensate for impacts to the wetland, and permitted uses in the wetland. The rating is the basis for determining the size of wetland buffers as mandated in Title 17 of the Lummi Code of Laws.

As a component of the rating process, a classification key was used to determine whether the wetland was riverine, depressional, slope, lake-fringe, tidal fringe or flats according to the HGM classification system.

2.4 Method for Updating the Lummi Nation GIS Wetland Inventory/Database

As described in Section 2.1, the updated wetland boundaries were recorded using a mapping grade Trimble GeoXT GPS unit, and downloaded into ArcMap9 GIS software. Once entered into the GIS, any newly identified wetland areas were assigned an identification number based on the Public Land Survey System (i.e., Township, Range, Section) information. If a new wetland area essentially replaced an existing wetland, the original identification number was retained. If a wetland boundary was for a wetland that had not been previously identified, a new number based on the Public Land Survey System was assigned. Other data that were entered into the GIS database for new wetlands included wetland area in acres and hectares, comments about location or other unique features of the wetland, wetland rating/classification, hydrogeomorphic classification, Cowardin classification, the date the wetland was mapped, and watershed name.

2.5 Method for Quality Control

The Water Resources Planner II participated in two separate courses where her derived wetland ratings/classifications were compared with those of other specialists as a control on the quality of the wetland rating/classification process. In addition, once mapped in the GIS, the wetland boundaries identified with the GPS unit were compared with the 2004 high-resolution aerial photographs and the LIDAR data.

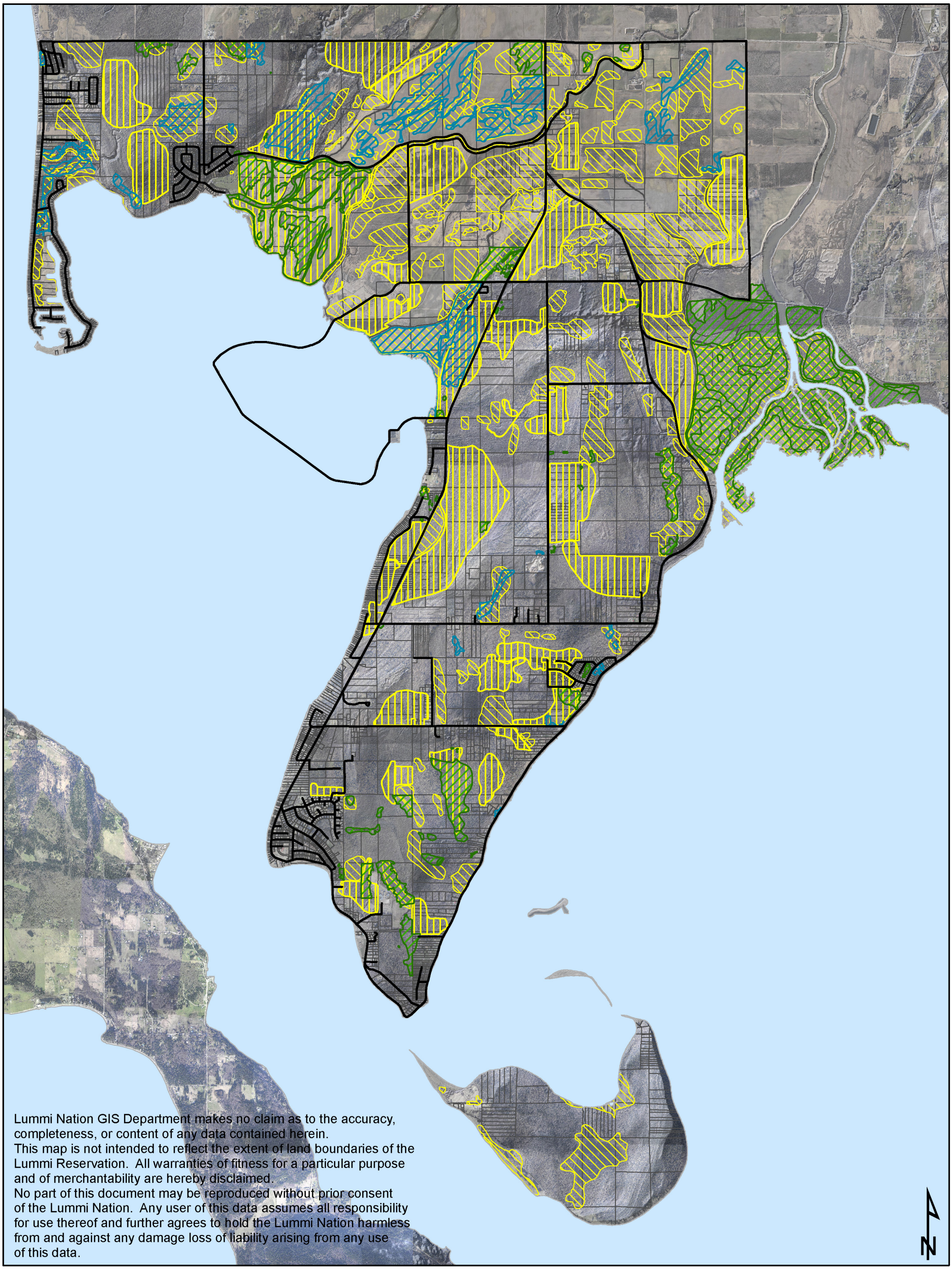
3. WETLAND INVENTORY UPDATE RESULTS

The results from the wetland inventory update are summarized below. Detailed field forms for each wetland are maintained on file at the Lummi Water Resources Division office and an example of the documentation is included as Appendix B of this synthesis report.

3.1 Results of Wetland Mapping and Boundary Determination

The thirty-seven (37) wetland areas on the Lummi Reservation that were field verified and mapped during the second year of the wetland inventory update effort are shown in Figure 3. Detailed maps of each of these wetland areas are presented in Appendix A. Figure 3 and each of the detailed maps presented in Appendix A show the wetland boundary identified as part of the second year of the inventory update in green, the first year of the inventory update in blue, and the estimated wetland boundaries from the 1999 inventory in yellow. In some cases, where wetland areas are small and/or wetlands were very close together, several wetlands are shown on the same map in Appendix A. As summarized in Table 1, a total of approximately 579 acres of wetlands were mapped during the second year of this effort.

Figure 3 - Upland Wetland Boundaries and Estimated Wetland Locations



Updated Wetland Boundary, 2005
Updated Wetland Boundary, 2006
Wetland-Estimated 1999
Wetland Complex-Estimated 1999
Parcels
Roads

0 1 2
Miles

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TREATY OF 1855

As evident in Figure 3 and the higher resolution mapping presented in Appendix A, the boundaries of all of the evaluated wetlands changed to some extent. Some of the wetlands were found to be smaller than mapped in the 1999 inventory, some were found to be larger than indicated in the 1999 inventory, some were found to be approximately the same size but in a slightly different location, and six (6) were newly identified wetlands. For comparision purposes, all but three of the maps in Appendix A have the same map scale (1:5,000). The last three maps in the series have a slightly smaller scale (1:7,000) so that the entire wetland area could be shown on one page. The wetland mapping and boundary determinations made during this Year 2 update effort and the associated wetland sizes are compared with the 1999 inventory results in Table 1.

As shown in Table 1, there were six wetland areas inventoried and mapped as part of this update that were not identified in the 1999 inventory. The area of these newly identified wetlands was approximately 6.71 acres. Including these six new wetland areas, a total of 19 wetland areas have larger areas than identified during the 1999 inventory for a 114.41 acre total increase in wetland area when compared with the 1999 inventory. A total of 18 of the wetland areas inventoried and mapped as part of this update were smaller than the areas mapped in the 1999 inventory for a 295.90 acre total decrease in wetland area when compared with the 1999 inventory. Overall, of the 37 wetland boundaries evaluated during Year 2, the total acreage of Reservation wetlands relative to the 1999 inventory decreased by 181.49 acres. When combined with the results from Year 1 (LWRD 2005), the net change in the total acreage of Reservation wetlands relative to the 1999 inventory has been a decrease of 216.29 acres.

Table 1 – Wetland Size Comparison Results

Wetland ID Number	Watershed Identification	1999 Inventory Wetland Size (Acres)	Inventory Update Wetland Size (Acres)	Difference in Wetland Size (Acres)
38N1E36-07[1]	E	0[1]	0.72	+0.72
38N1E25-02	G	9.34	1.96	-7.38
38N1E25-04[2]	G	30.34	12.27	-18.07
38N1E25-13[1]	G	0[1]	0.90	+0.90
38N1E25-14[1]	G	0[1]	1.81	+1.81
38N1E26-07[1]	G	0[1]	2.79	+2.79
38N1E24-04[1]	I	0[1]	0.41	+0.41
38N2E06-19	K	9.81	3.54	-6.27
38N2E06-14	K	3.82	4.03	+0.21
38N2E06-09	K	5.33	19.70	+14.37
38N2E06-11	K	46.81	16.09	-30.72
38N2E06-07	K	2.49	1.06	-1.43
38N1E11-21	K	99.69	47.40	-52.29
38N1E14-04	K	55.73	55.75	+0.02
38N1E14-05	K	48.44	37.00	-11.44
38N1E11-19	K	15.76	25.67	+9.91
38N1E02-15	O	3.75	2.11	-1.64
38N1E02-13	O	9.53	3.65	-5.88
38N1E02-14	O	3.16	6.39	+3.23
38N1E02-01	O	13.78	14.41	+0.63
38N1E02-02	O	13.32	7.14	-6.18
38N1E02-05	O	29.15	23.92	-5.23
38N1E02-17	O	18.76	60.24	+41.48
38N1E02-03	O	5.97	5.52	-0.45
38N1E01-08	O	61.81	23.90	-37.91
38N1E01-07	O	16.29	38.57	+22.28
38N1E03-07	P	3.32	8.41	+5.09
38N1E03-01	P	77.68	77.07	-0.61
38N1E04-01	Q	53.86	24.62	-29.24
38N1E03-08A	Q	9.94	0.90	-9.04
38N1E03-08B[1]	Q	0[1]	0.08	+0.08
38N1E04-06[2]	Q	80.86	8.94	-71.92
38N1E05-01	R	7.90	9.48	+1.58
38N1E04-07	R	10.70	16.23	+5.53
38N1E05-02	R	2.18	1.98	-0.20
38N1E08-01	R	5.21	6.57	+1.36
38N1E08-02	R	5.82	7.83	+2.01
	Total	760.55	579.06	-181.49

Notes:
[1] Wetland not identified in 1999 Inventory.
[2] No function assessment or rating has been performed on wetland to date.

3.2 Results of Function Assessment

The Washington State Function Assessment Method (WAFAM) was applied to thirty-four (34) of the thirty-seven (37) wetland Assessment Units (AUs). The WAFAM methodology has not been developed for tidal fringe wetlands, so the method was not applied to wetland 38N1E14-05. Instead of selecting an appropriate method at this time, the most appropriate method will be selected in upcoming years, and then function assessments will be conducted for the tidal fringe wetlands as a group at a later date.

Table 2 presents the indices for each AU for the functions that were assessed during Year 2 of the study. The general locations of the wetlands that were evaluated are shown in Figure 3, the specific locations are shown on individual maps in Appendix A, and a sample of field notes and function assessment worksheets are provided in Appendix B. As demonstrated by the results summarized in Table 2, a particular AU may vary significantly in its relative performance of one function to another. The WAFAM methodology was not designed to lump functions into group scores or to rank functions hierarchically by importance. Therefore, AUs are not compared using an overall index. Rather, the potential performance levels (the index) for each function are compared among the AUs of the same Hydrogeomorphic (HGM) category. Since different models were developed for each subclass, it is not meaningful to compare across categories. That is, riverine flow-through wetlands cannot be reasonably compared to depressional outflow wetlands. Each function index in the WAFAM is essentially a comparison of the assessed wetland to a large pool of reference wetlands.

The WAFAM methodology includes classification for riverine and depressional wetlands into subdivisions including Riverine Flow-through, Riverine Impounding, Depressional Outflow, and Depressional Closed. As summarized in Table 2, twenty-nine (29) of the evaluated wetlands met the definition of depressional closed wetlands, two (2) met the definition of depressional outflow wetlands, three (3) met the definition of riverine impounding wetlands, and one (1) met the definition of a tidal fringe wetland under the HGM subclass system.

Table 2: Summary of Year 2 Function Assessments by Wetland ID number, Watershed, and HGM Subclass

Wetland Name: Assessment Unit ID Number	38N1E36-07	38N1E25-02	38N1E25-13	38N1E25-14	38N1E26-07	38N1E24-04	38N2E06-19	38N2E06-14	38N2E06-09	38N2E06-11	38N2E06-07	38N1E11-21
Watershed ID	E	G	G	G	G	I	K	K	K	K	K	K
Hydrogeomorphic Subclass	DC	DC	DC	DC	DC	DC	DC	RIV	DC	DC	DC	DC
Water Quality Functions												
Removing Sediment	10	10	10	10	10	10	10	6	10	10	10	10
Removing Nutrients	5	8	5	5	5	5	5	4	5	5	5	5
Removing Heavy Metals and Toxic Organics	6	3	2	3	4	1	6	5	6	6	6	2
Water Quantity Functions												
Reducing Peak Flows	10	10	10	10	10	10	10	6	10	10	10	10
Reducing Downstream Erosion	10	10	10	10	10	10	10	9	10	10	10	10
Recharging Ground Water	7	2	2	6	7	3	7	7	7	7	7	3.
Habitat Suitability Functions												
General Habitat Suitability	2	5	5	3	5	3	1	6	2	2	1	7
Suitability for Invertebrates	1	4	3	3	3	2	0	4	1	1	0	5
Suitability for Amphibians	1	2	2	1	2	2	1	3	1	1	1	3
Suitability for Anadromous Fish	NA	NA	NA	NA	NA	NA	NA	3	NA	NA	NA	NA
Suitability for Resident Fish	NA	NA	NA	NA	NA	NA	NA	2	NA	NA	NA	NA
Suitability for Wetland Associated Birds	3	4	5	3	4	4	2	5	3	3	2	6
Suitability for Wetland Associated Mammals	3	3	3	1	4	4	2	5	3	3	2	4
Native Plant Richness	1	6	6	4	7	4	1	6	1	1	1	8
Primary Production and Export	NA	NA	NA	NA	NA	NA	NA	8	NA	NA	NA	NA

Notes:

- The numeric index represents the potential level of performance of a function on a scale of 0 to 10. Depressional closed wetlands always score a "10" for removing sediment, reducing peak flows, and reducing downstream erosion because they are closed systems with no outlets and are performing at their maximum because no sediment can leave the wetland. A "NA" indicator for anadromous fish or for production and export indicates that no outlets or flow through streams are present.
- Key for Hydrogeomorphic (HGM) Subclass identification: DC = Depressional Closed, DO = Depressional Outflow, RIV = Riverine Impounding, TF = Tidal Fringe.

Table 2: Summary of Year 2 Function Assessments by Wetland ID number, Watershed, and HGM Subclass

Wetland Name: Assessment Unit ID Number	38N1E14-04	38N1E14-05	38N1E11-19	38N1E02-15	38N1E02-13	38N1E02-14	38N1E02-01	38N1E02-02	38N1E02-05	38N1E02-17	38N1E02-03	38N1E01-08
Watershed ID	K	K	K	O	O	O	O	O	O	O	O	O
Hydrogeomorphic Subclass	DC	TF	DC	DC	DC	DC	DC	DC	DC	DC	DC	DC
Water Quality Functions												
Removing Sediment	10	NA	10	10	10	10	10	10	10	10	10	10
Removing Nutrients	5	NA	5	5	5	5	5	5	5	5	5	5
Removing Heavy Metals and Toxic Organics	6	NA	5	6	6	6	6	6	6	6	6	6
Water Quantity Functions												
Reducing Peak Flows	10	NA	10	10	10	10	10	10	10	10	10	10
Reducing Downstream Erosion	10	NA	10	10	10	10	10	10	10	10	10	10
Recharging Ground Water	7	NA	9	7	7	7	7	7	7	7	6	6
Habitat Suitability Functions												
General Habitat Suitability	2	NA	6	1	1	1	1	1	1	1	1	2
Suitability for Invertebrates	1	NA	4	1	1	1	1	1	1	1	1	1
Suitability for Amphibians	2	NA	2	1	1	1	1	1	1	1	1	2
Suitability for Anadromous Fish	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Suitability for Resident Fish	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Suitability for Wetland Associated Birds	4	NA	6	2	2	2	2	2	3	3	3	3
Suitability for Wetland Associated Mammals	3	NA	7	4	4	4	4	4	3	3	3	4
Native Plant Richness	2	NA	8	1	1	1	1	1	1	1	1	1
Primary Production and Export	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

- The numeric index represents the potential level of performance of a function on a scale of 0 to 10. Depressional closed wetlands always score a "10" for removing sediment, reducing peak flows, and reducing downstream erosion because they are closed systems with no outlets and are performing at their maximum because no sediment can leave the wetland. A "NA" indicator for anadromous fish or for production and export indicates that no outlets or flow through streams are present.
- Key for Hydrogeomorphic (HGM) Subclass identification: DC = Depressional Closed, DO = Depressional Outflow, RIV = Riverine Impounding, TF = Tidal Fringe.

Table 2: Summary of Year 2 Function Assessments by Wetland ID number, Watershed, and HGM Subclass

Wetland Name: Assessment Unit ID Number	38N1E01-07	38N1E03-07	38N1E03-01	38N1E04-01	38N1E03-08A	38N1E03-08B	38N1E05-01	38N1E04-07	38N1E05-02	38N1E08-01	38N1E08-02
Watershed ID	O	P	P	Q	Q	Q	R	R	R	R	R
Hydrogeomorphic Subclass	DC	DC	DC	RIV	DC	DC	RIV	DO	DC	DC	DO
Water Quality Functions											
Removing Sediment	10	10	10	6	10	10	9	7	10	10	8
Removing Nutrients	5	8	8	7	5	5	8	7	10	5	7
Removing Heavy Metals and Toxic Organics	5	4	6	6	4	4	7	4	7	4	6
Water Quantity Functions											
Reducing Peak Flows	10	10	10	9	10	10	7	7	10	10	7
Reducing Downstream Erosion	10	10	10	10	10	10	9	10	10	10	7
Recharging Ground Water	6	3	7	7	7	7	5	9	3	3	7
Habitat Suitability Functions											
General Habitat Suitability	3	6	7	7	4	4	7	7	7	2	2
Suitability for Invertebrates	3	6	6	6	3	3	4	5	6	2	2
Suitability for Amphibians	2	3	5	5	2	2	7	4	7	4	4
Suitability for Anadromous Fish	NA	NA	NA	4	NA	NA	4	2	NA	NA	2
Suitability for Resident Fish	NA	NA	NA	6	NA	NA	8	3	NA	NA	3
Suitability for Wetland Associated Birds	5	4	5	4	4	4	8	7	8	4	3
Suitability for Wetland Associated Mammals	4	4	7	5	4	4	7	6	7	4	4
Native Plant Richness	1	8	8	8	6	6	6	7	7	2	1
Primary Production and Export	NA	NA	NA	6	NA	NA	5	9	NA	NA	8

Notes:

- The numeric index represents the potential level of performance of a function on a scale of 0 to 10. Depressional closed wetlands always score a "10" for removing sediment, reducing peak flows, and reducing downstream erosion because they are closed systems with no outlets and are performing at their maximum because no sediment can leave the wetland. A "NA" indicator for anadromous fish or for production and export indicates that no outlets or flow through streams are present.
- Key for Hydrogeomorphic (HGM) Subclass identification: DC = Depressional Closed, DO = Depressional Outflow, RIV = Riverine Impounding, TF = Tidal Fringe.

3.3 Results of Wetland Classification

The Washington State Wetland Rating system was applied to thirty-five (35) assessment units on the Reservation. Table 3 presents the ratings for each AU.

Although none of the wetlands evaluated during this Year 2 inventory update effort were rated as Category 1 wetlands, it is anticipated that Category 1 wetlands may be encountered during future years of this study. Of the thirty-five (35) wetlands classified during Year 2, three (3) wetlands were Category 2 wetlands, seventeen (17) were Category 3 wetlands, and fifteen (15) wetlands were Category 4 wetlands.

The Washington State Wetland Rating system uses only the highest grouping in the HGM classification (i.e. wetland class). As summarized in Table 3, under the HGM classification system, thirty-one (31) of the Reservation wetlands rated during Year 2 were depressional wetlands, three (3) were riverine wetlands, and one (1) was a tidal fringe wetland.

Table 3 – Wetland Rating and HGM Classification

Wetland ID Number	Watershed Identification	Wetland Rating	HGM Class
38N1E36-07	E	3	Depressional
38N1E25-02	G	3	Depressional
38N1E25-13	G	3	Depressional
38N1E25-14	G	4	Depressional
38N1E26-07	G	4	Depressional
38N1E24-04	I	3	Depressional
38N2E06-19	K	4	Depressional
38N2E06-14	K	2	Riverine
38N2E06-09	K	3	Depressional
38N2E06-11	K	3	Depressional
38N2E06-07	K	3	Depressional
38N1E11-21	K	3	Depressional
38N1E14-04	K	3	Depressional
38N1E14-05	K	2	Tidal Fringe
38N1E11-19	K	3	Depressional
38N1E02-15	O	4	Depressional
38N1E02-13	O	4	Depressional
38N1E02-14	O	4	Depressional
38N1E02-01	O	4	Depressional
38N1E02-02	O	4	Depressional
38N1E02-05	O	4	Depressional
38N1E02-17	O	4	Depressional
38N1E02-03	O	4	Depressional
38N1E01-08A	O	4	Depressional
38N1E01-07	O	3	Depressional
38N1E03-07	P	3	Depressional
38N1E03-01	P	3	Depressional
38N1E04-01	Q	3	Riverine
38N1E03-08A	Q	4	Depressional
38N1E03-08B	Q	4	Depressional
38N1E05-01	R	3	Riverine
38N1E04-07	R	3	Depressional
38N1E05-02	R	2	Depressional
38N1E08-01	R	4	Depressional
38N1E08-02	R	3	Depressional

4. DISCUSSION

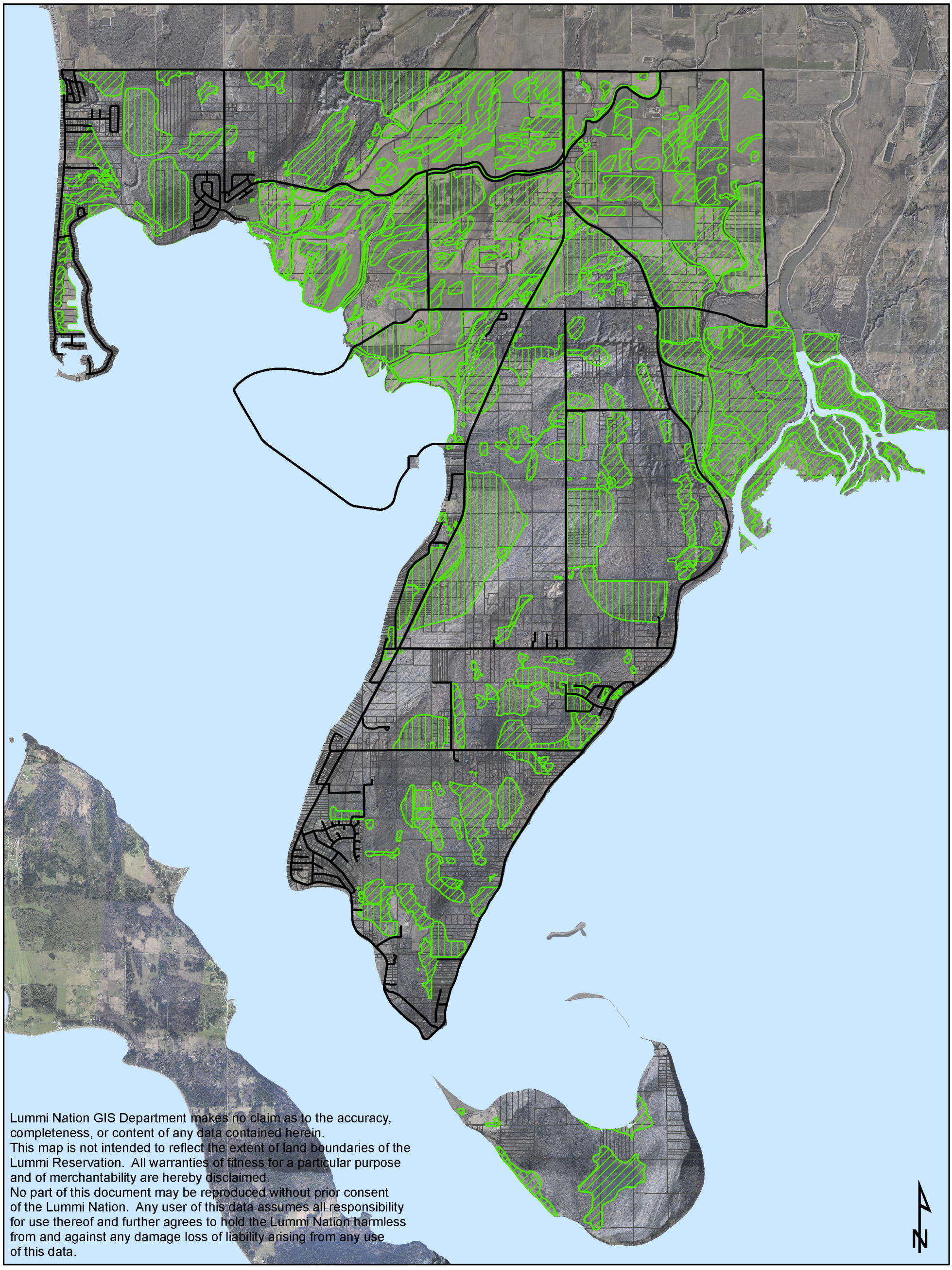
Accurate information on the locations, functions, and wetland category is needed in order to effectively manage Reservation wetlands pursuant to the Lummi Nation Water Resources Protection Code (Title 17 of the Lummi Code of Laws [LCL]). Although the 1999 inventory represents an important planning tool and a significant improvement over the previously available information, it has proven to be too general for more detailed level planning efforts. Refining the spatial resolution of the wetland mapping, performing function assessments, and classifying the wetlands into the regulatory categories identified in Title 17 is intended to support efforts to protect these wetland resources and the important ecological, hydrological, and water quality protection functions that they provide. Because of the large number of wetland areas on the Reservation, the effort to refine the spatial resolution of the wetland mapping, to perform function assessments, and to classify the Reservation wetlands is projected to require several years to complete. This report summarizes the results of the second year of this inventory update effort.

The overall result of the inventory update effort will be a more accurate GIS data layer and an associated database that contains the classification and other summary information on each wetland on the Reservation. Hard copies of field notes (e.g., function assessment work sheets, wetland rating worksheets, location maps) are maintained in binders in the Lummi Water Resources Division office. Until the update effort is completed, the GIS data layer and associated database will be a work in progress. The current version of the Lummi Reservation Wetland Map is shown in Figure 4. Figure 4 shows the information in Figure 3 except that the 1999 wetland locations that were revised during Year 1 and Year 2 of this update effort have been removed.

As described previously, Year 2 of this inventory update resulted in revising the locations and extent of thirty-seven (37) wetlands, collecting additional information on the functions of thirty-five (35) wetlands, and classifying thirty-five (35) wetlands into one of four categories. Based on the changes to the spatial locations and the utility of the collected information on wetland function and category, the inventory update should continue until it is completed.

Future phases of this study will include estuarine wetlands, which are Category 1 wetlands if they are relatively undisturbed and are larger than one acre. Estuarine wetlands are not included in the classes of wetlands that are covered by the WAFAM method at this time, so a different method will need to be used, or the evaluation of these wetlands delayed until the methodology is developed.

Figure 4 - Best Available Wetland Inventory Map (December 2006)



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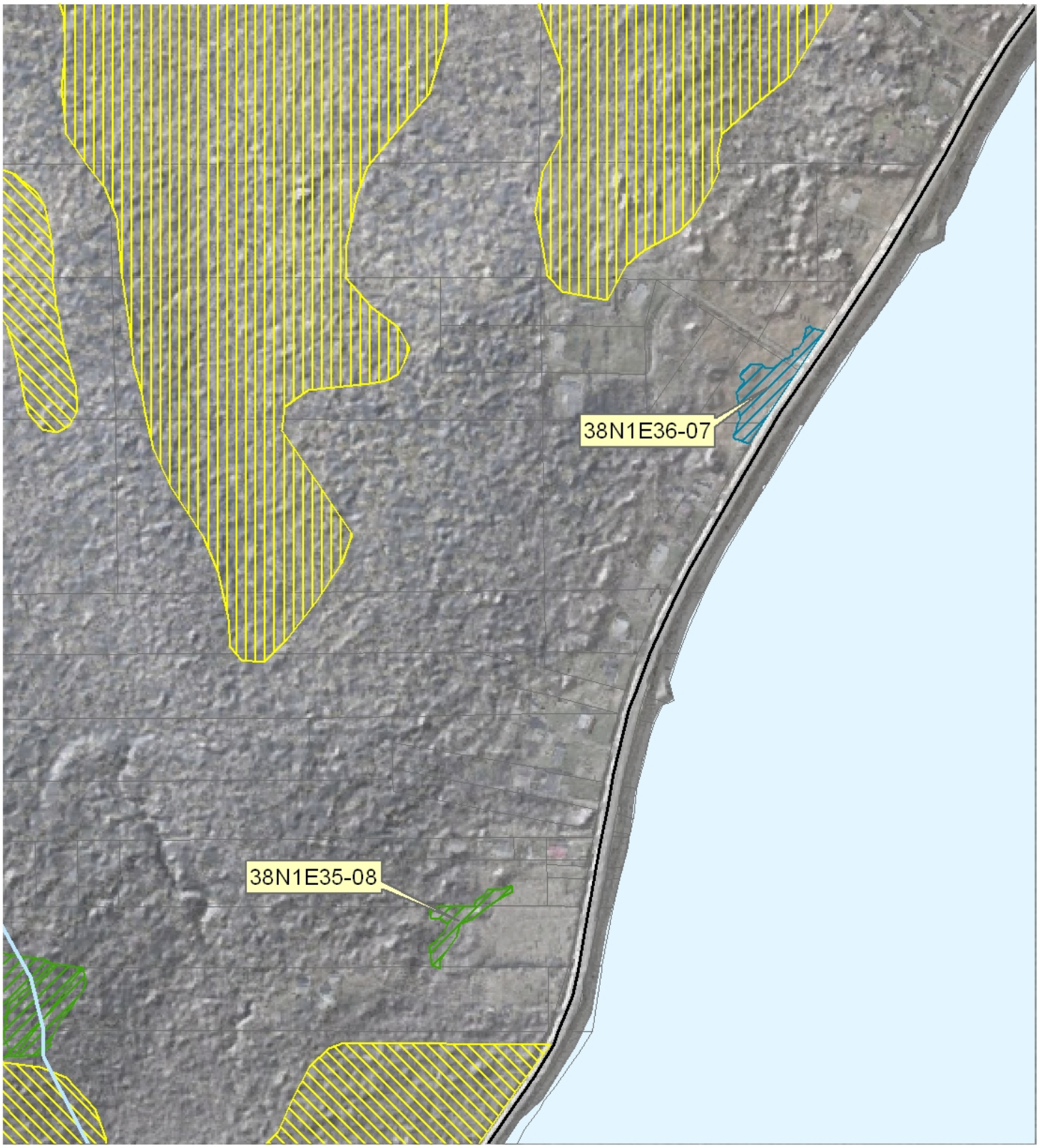
APPENDIX A – INDIVIDUAL WETLAND MAPS

38N1E36-07



N

Wetlands
- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)

- Approximate Channel Location
- Parcels

0 250 500
Feet

Lummi Nation makes no claim as to the accuracy, completeness, or content of any data contained herein.This map is not intended to reflect the extent of land boundaries of the Lummi Reservation. All warranties of fitness for a particular purpose and of merchantability are hereby disclaimed.

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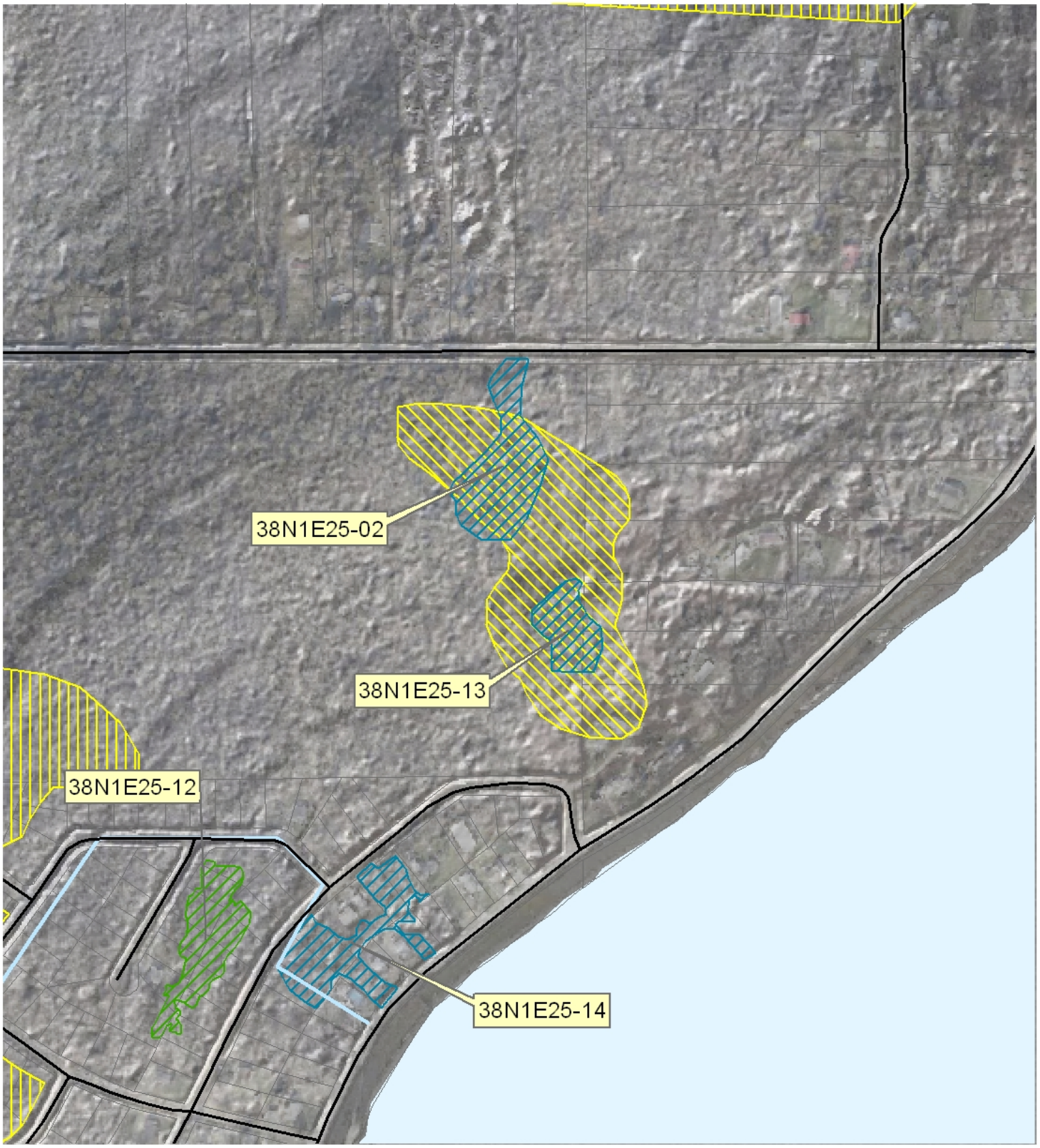

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Wetlands
- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)

- Approximate Channel Location
- Parcels

0 250 500
Feet

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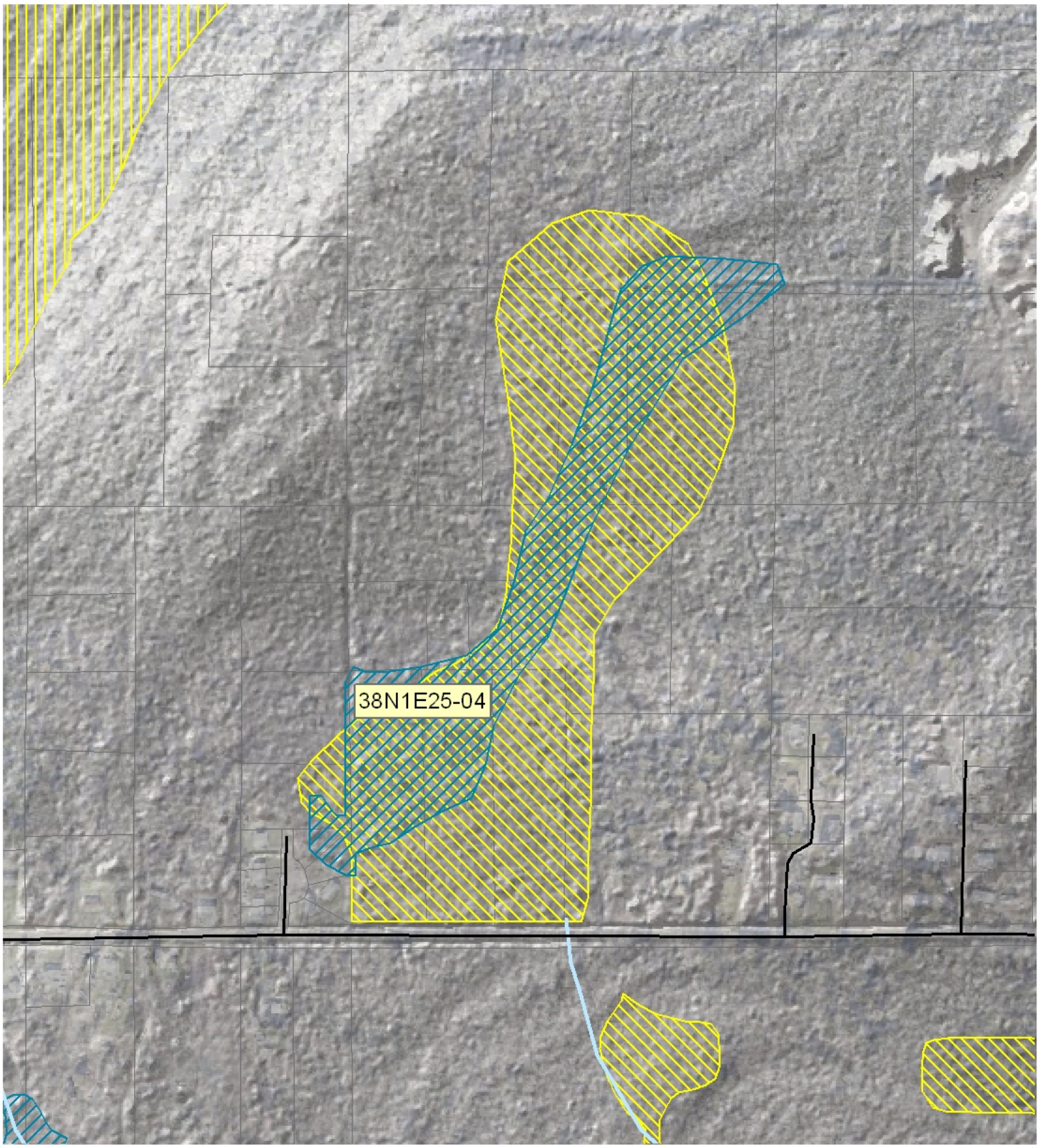

N

Wetlands

- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)
- Approximate Channel Location
- Parcels

0 250 500

Feet

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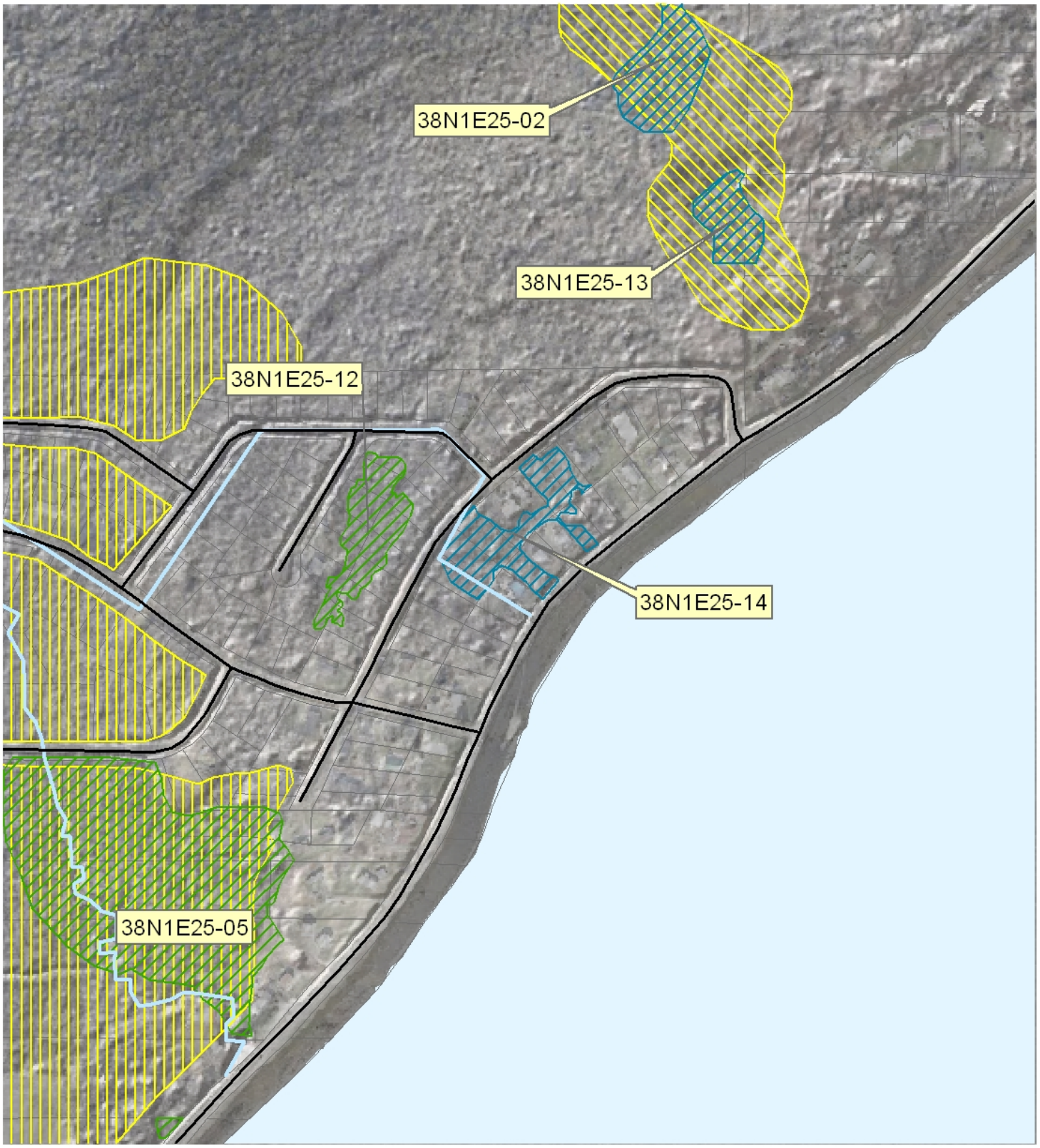

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Wetlands
- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)

- Approximate Channel Location
- Parcels

0 250 500
Feet

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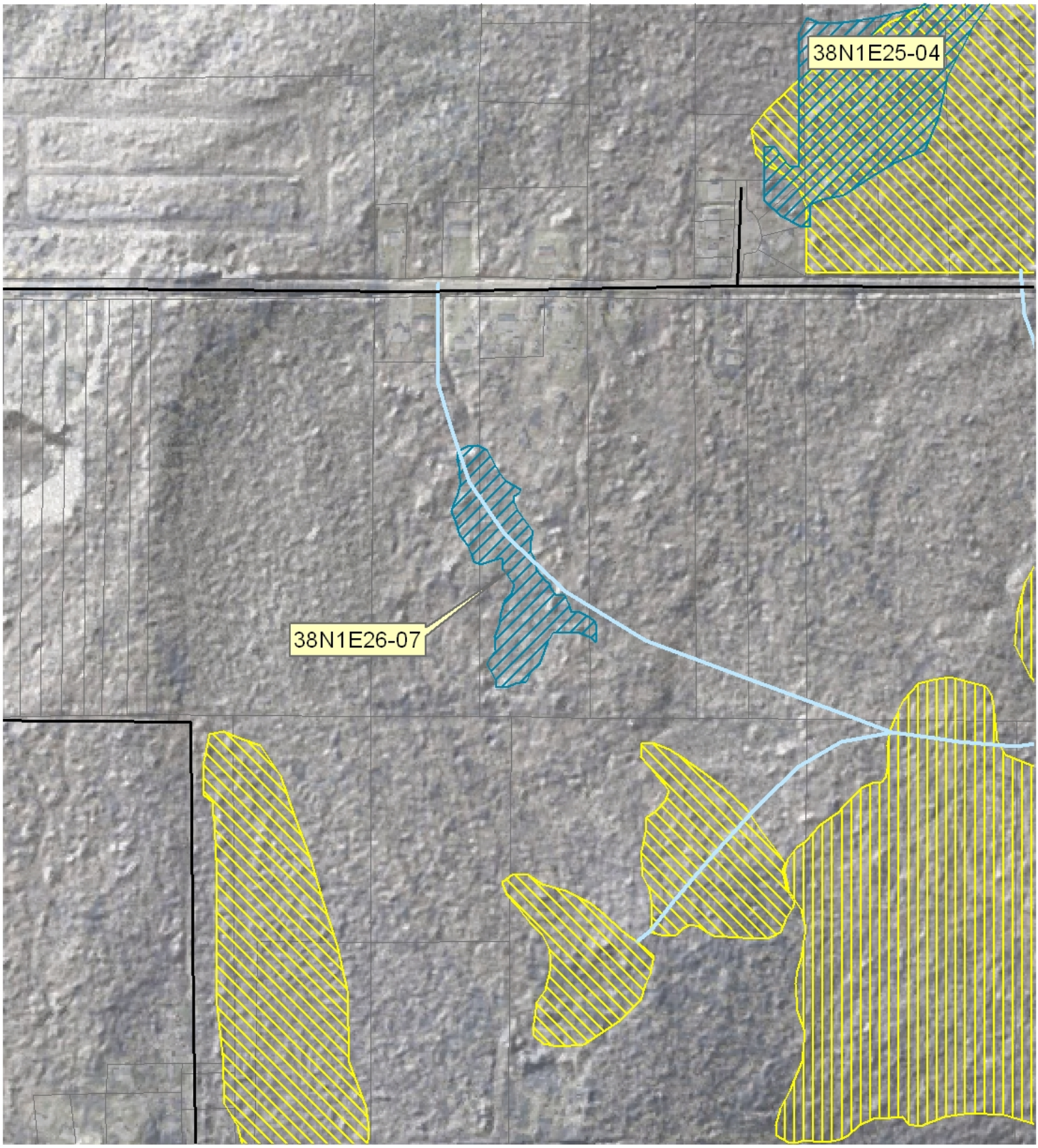

N

Wetlands
- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)

- Approximate Channel Location
- Parcels

0 250 500
Feet

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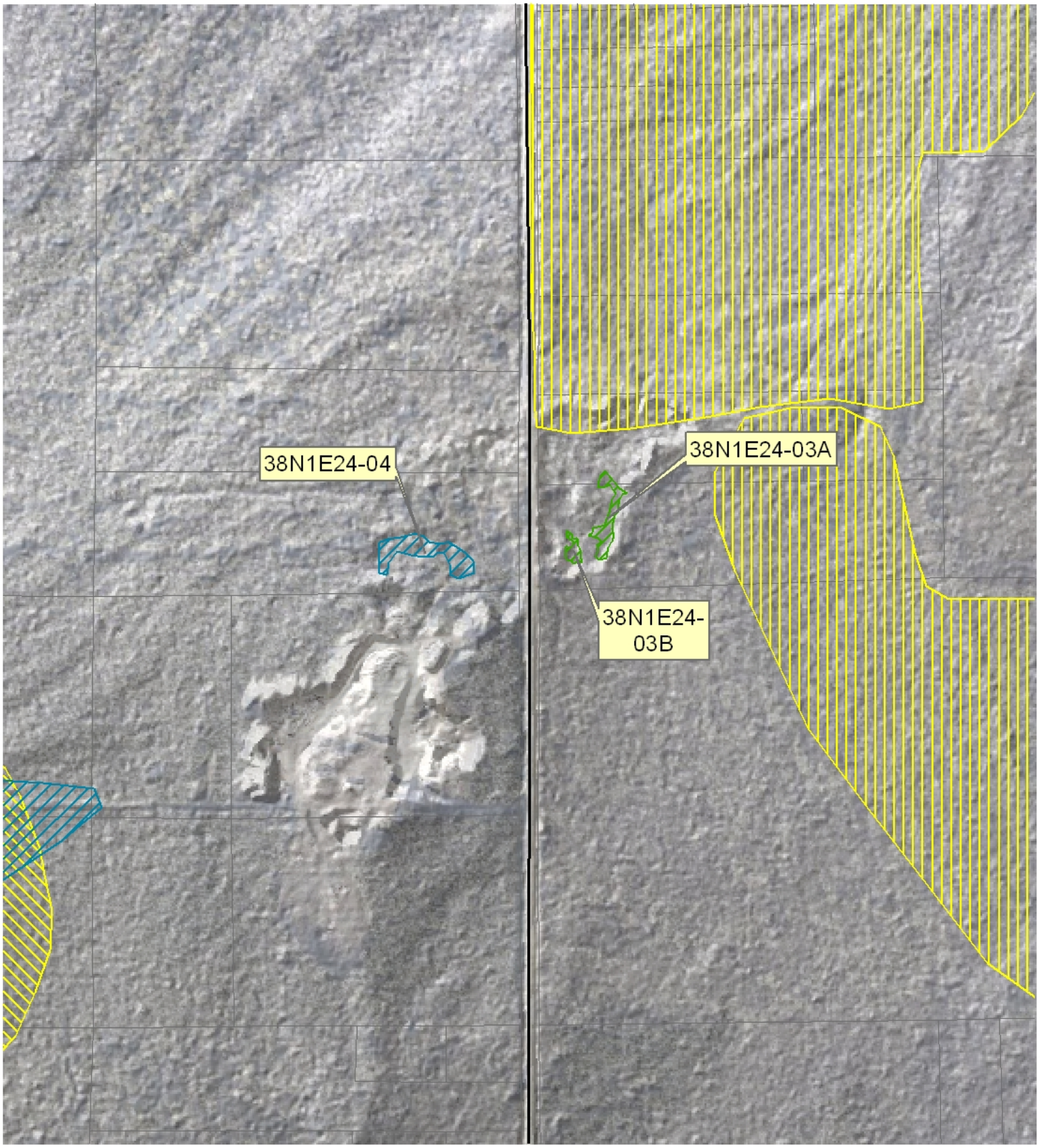

N

Wetlands
- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)

- Approximate Channel Location
- Parcels

0 250 500
Feet

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38N2E06-19

N

Wetlands

- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)
- Approximate Channel Location
- Parcels

0 250 500

Feet

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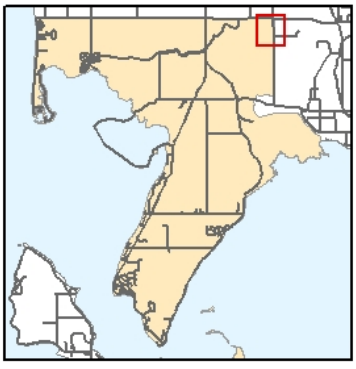

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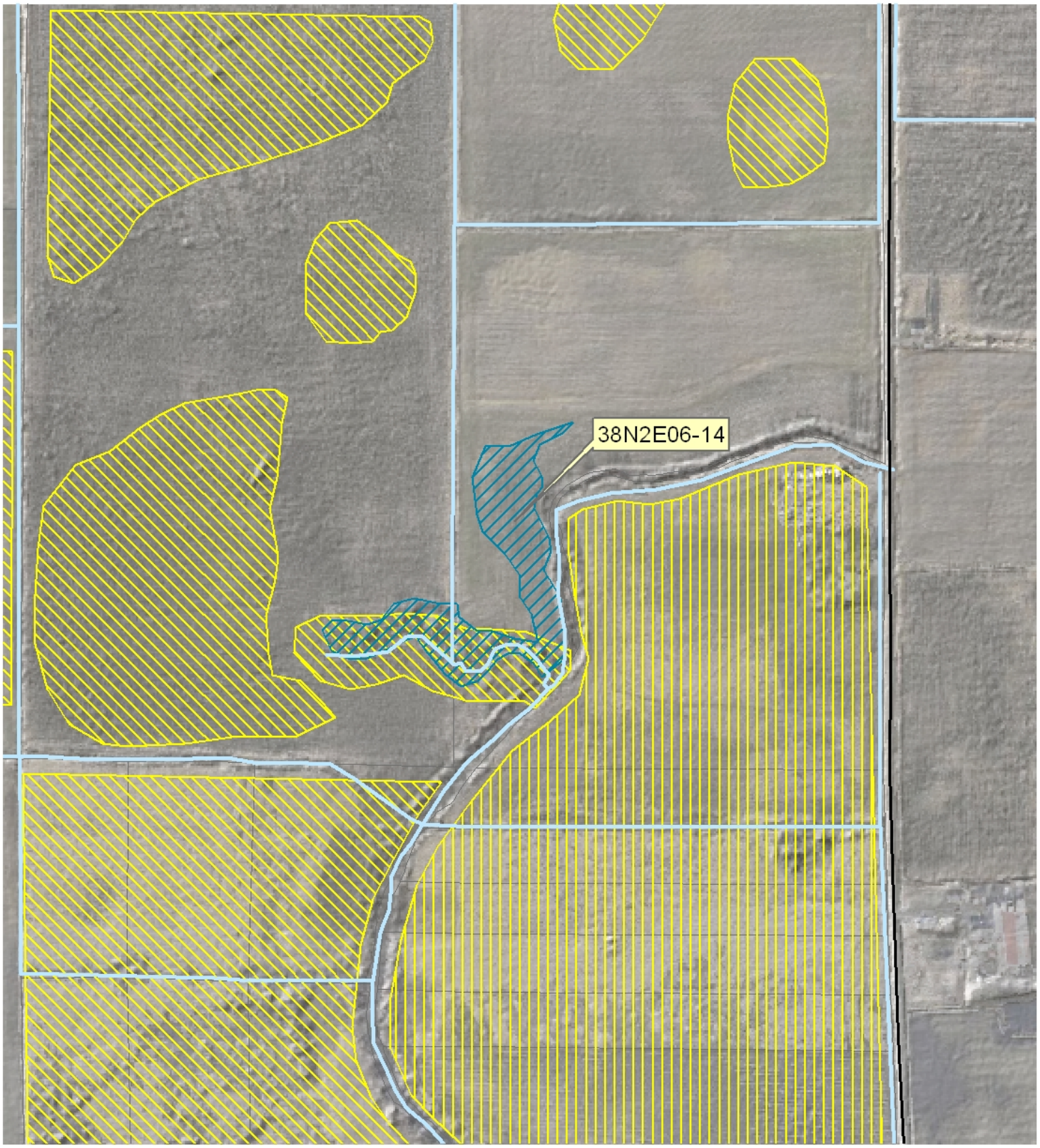

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Wetlands

- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)
- Approximate Channel Location
- Parcels

0 250 500

Feet

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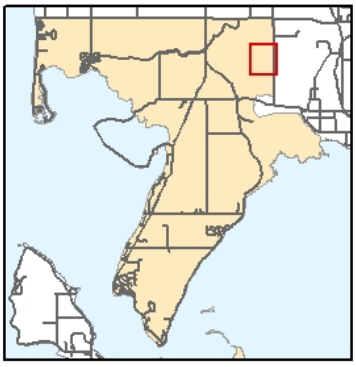

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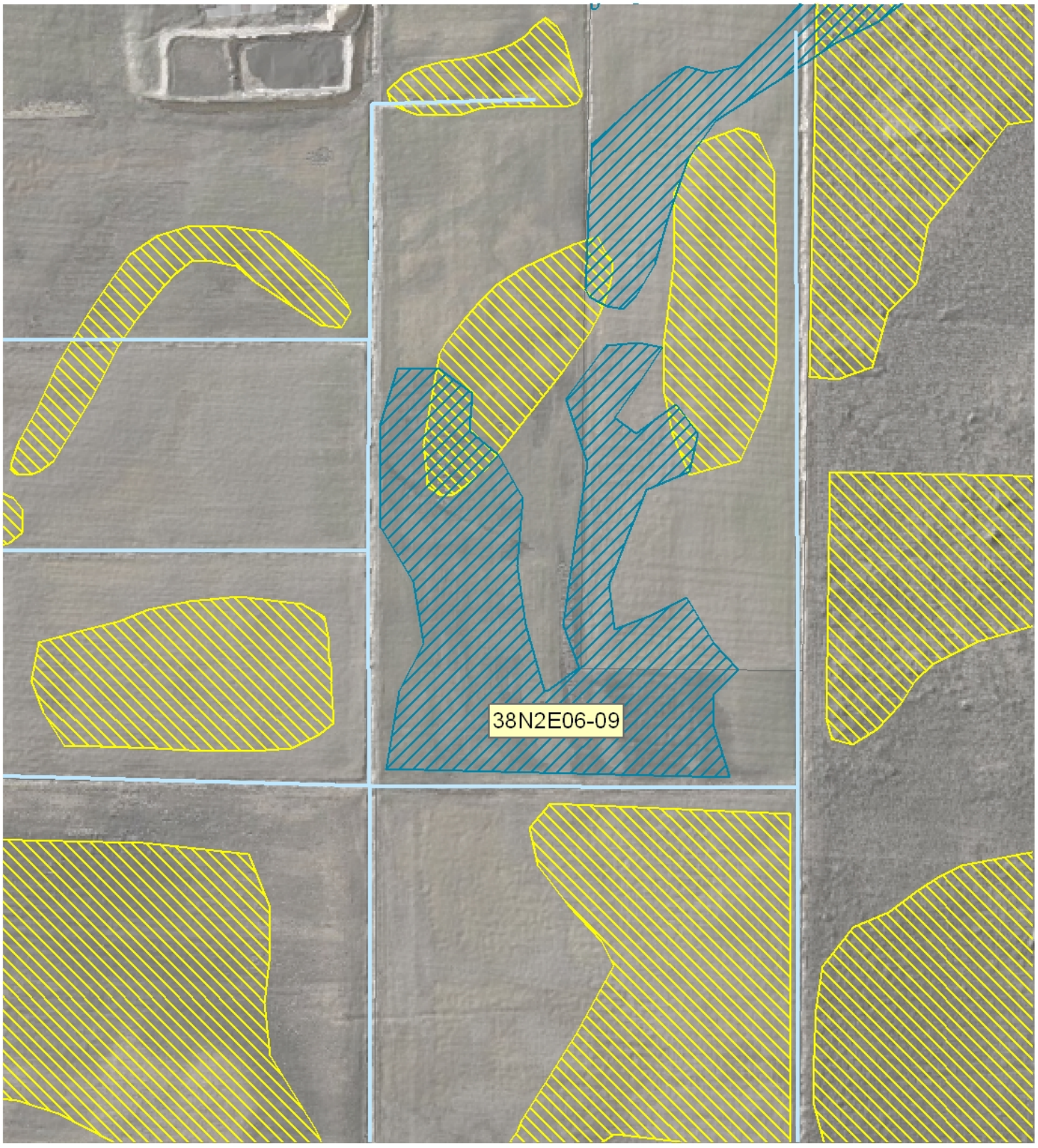

N

Wetlands

- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)
- Approximate Channel Location
- Parcels

0 250 500

Feet

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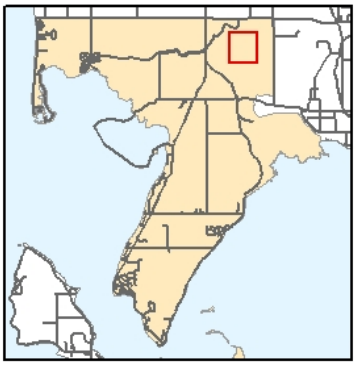

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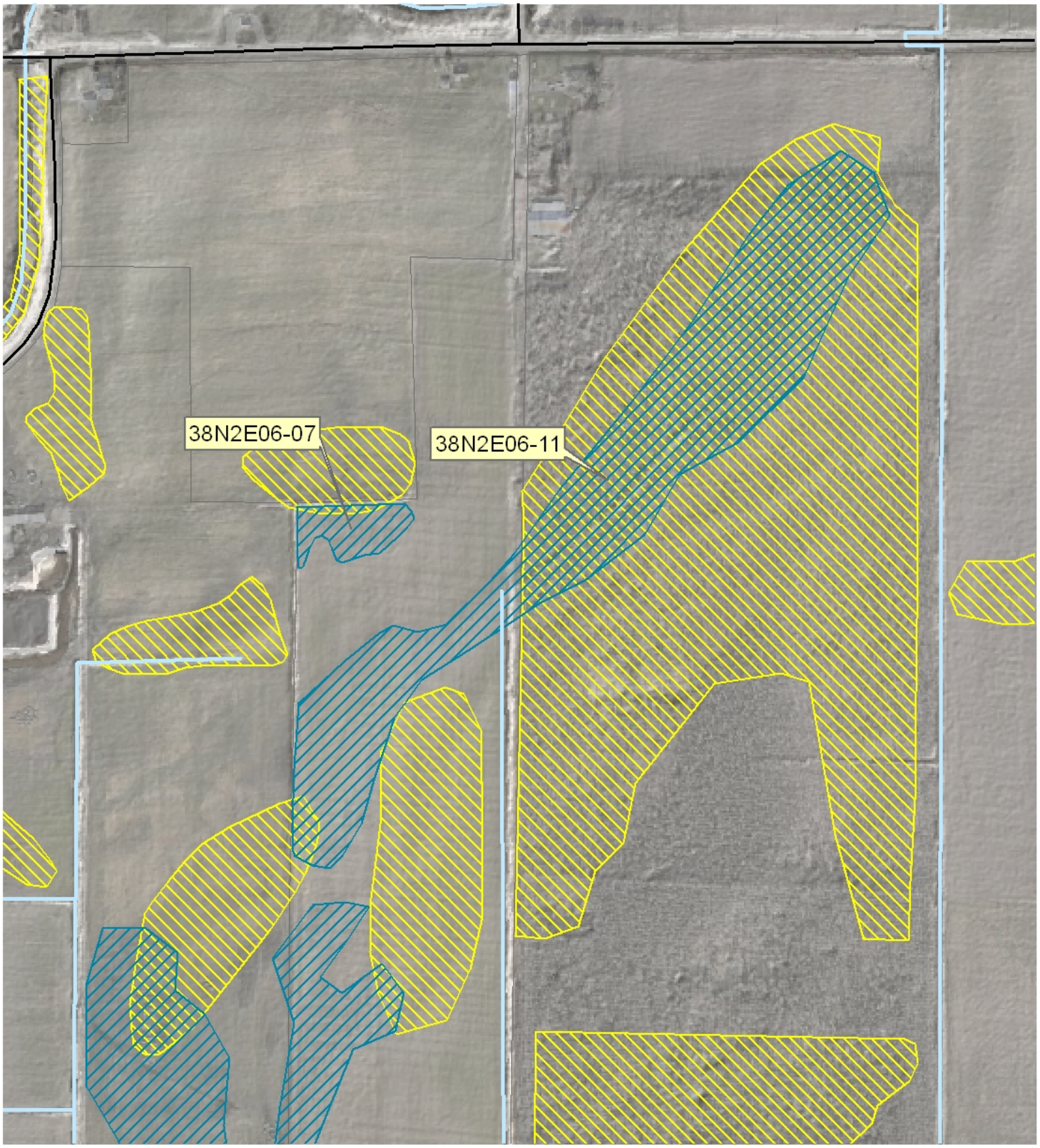

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Wetlands
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- Updated 2006
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- Wetland Complex (Estimated 1999)
- Approximate Channel Location
- Parcels

0 250 500
Feet

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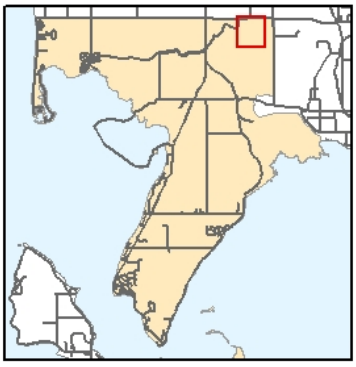

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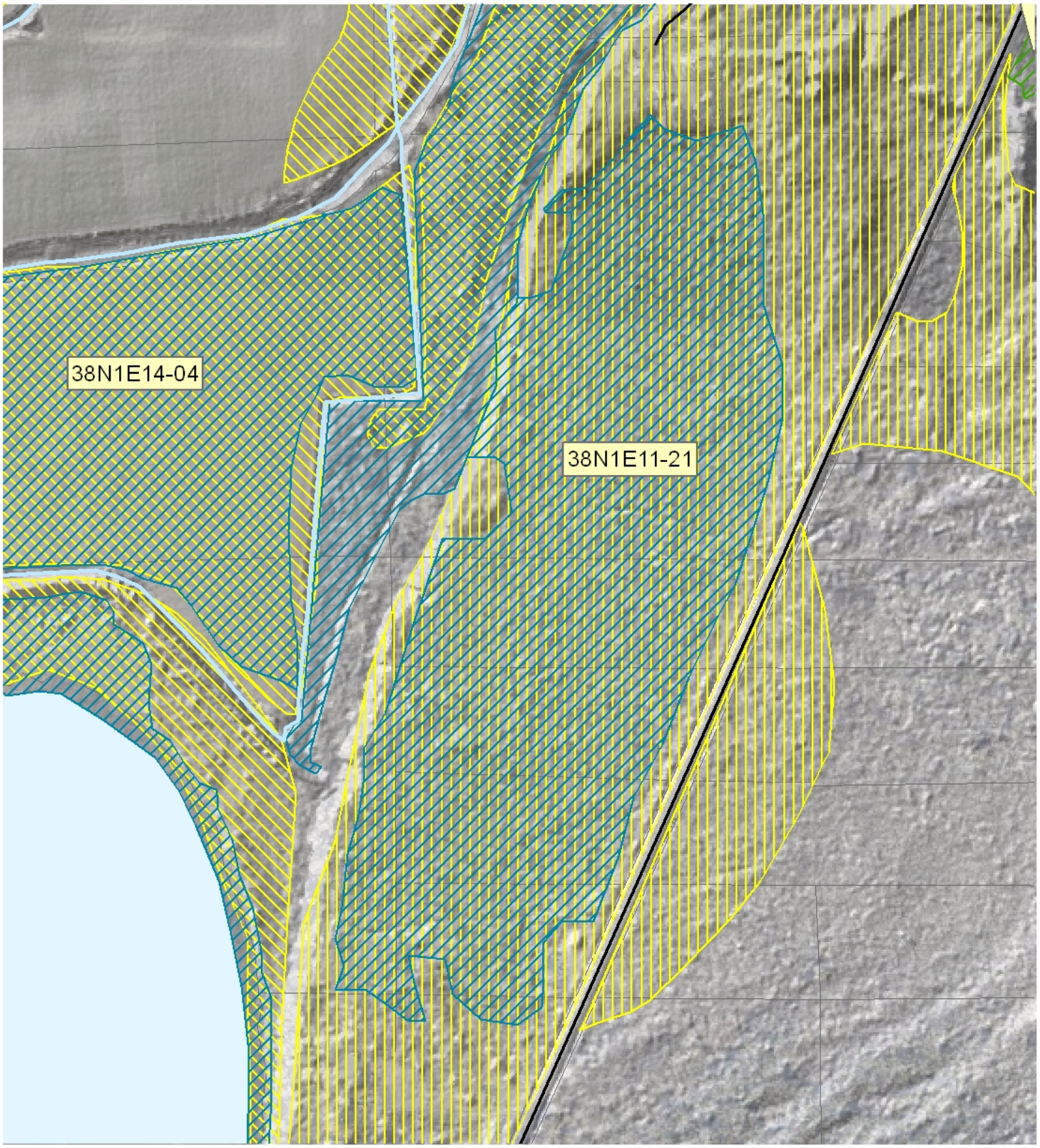

N

Wetlands
- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)

Approximate Channel Location

Parcels

0 250 500
Feet

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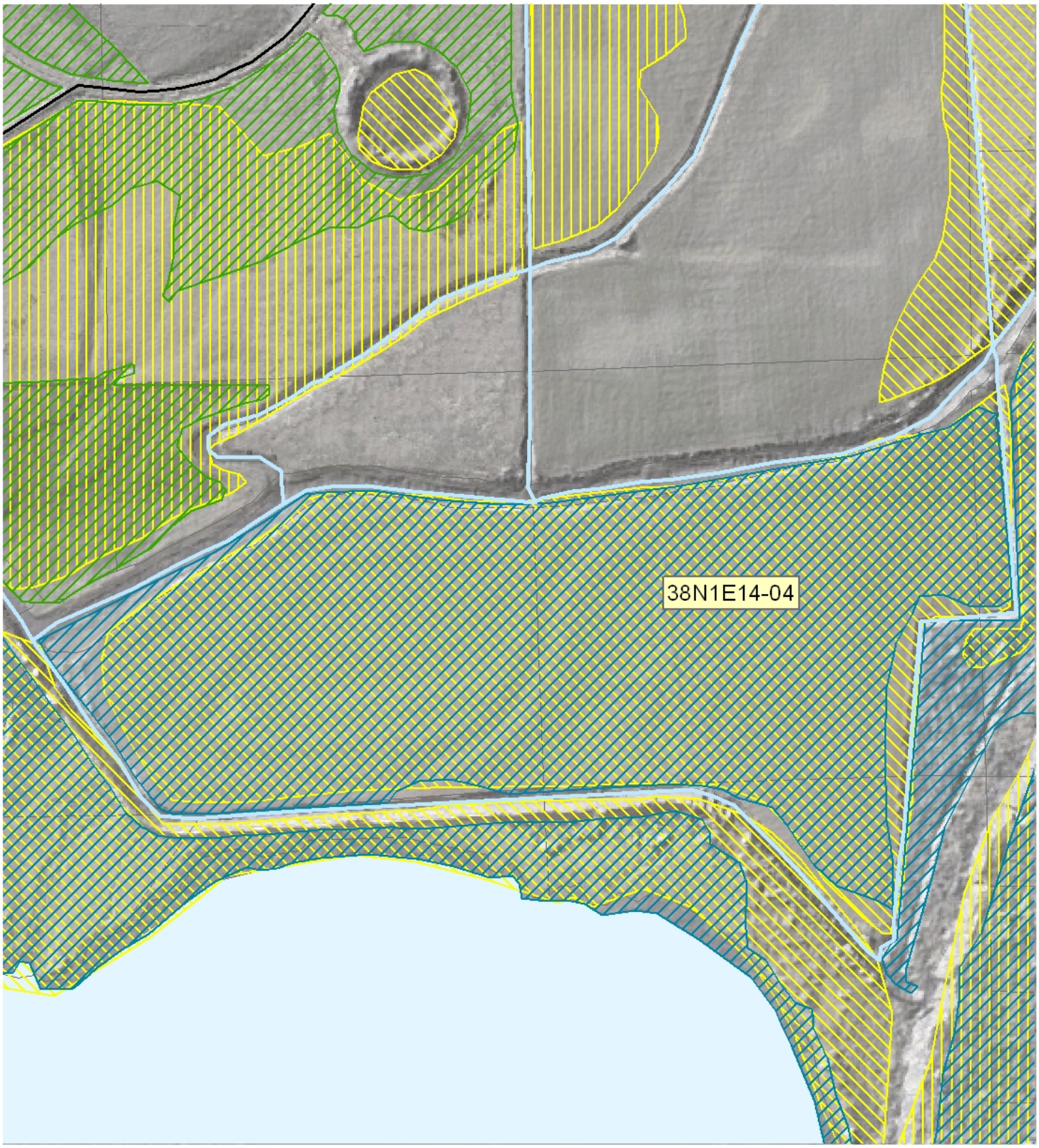
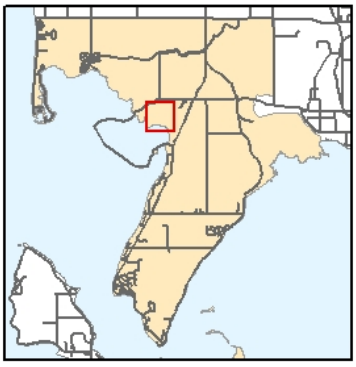
38N1E14-04



N

Wetlands

- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)
- Approximate Channel Location
- Parcels



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Feet

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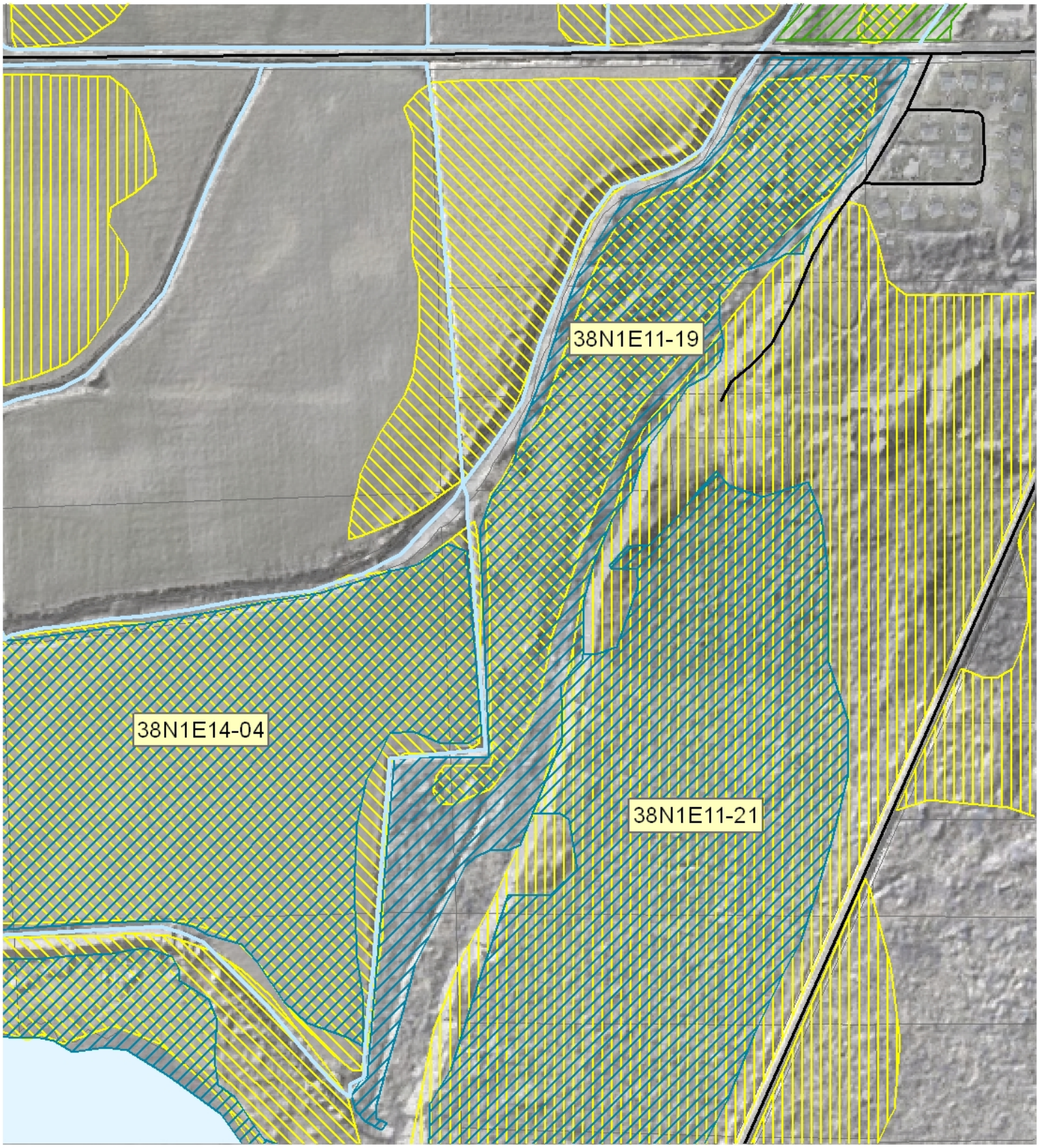
38N1E11-19



N

Wetlands
- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)

- Approximate Channel Location
- Parcels

0 250 500
Feet

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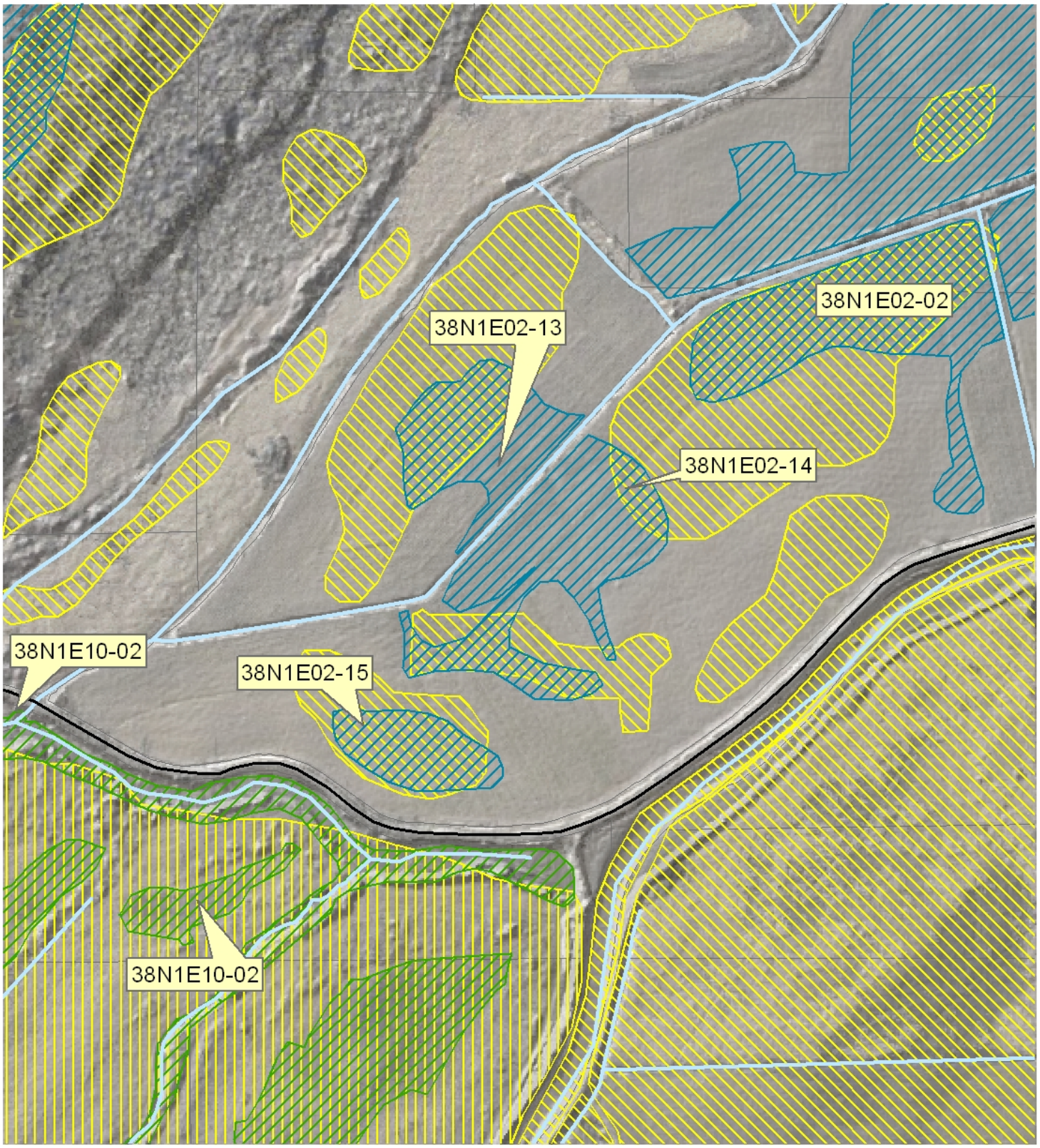
38N1E02-13, 38N1E02-14, and 38N1E02-15



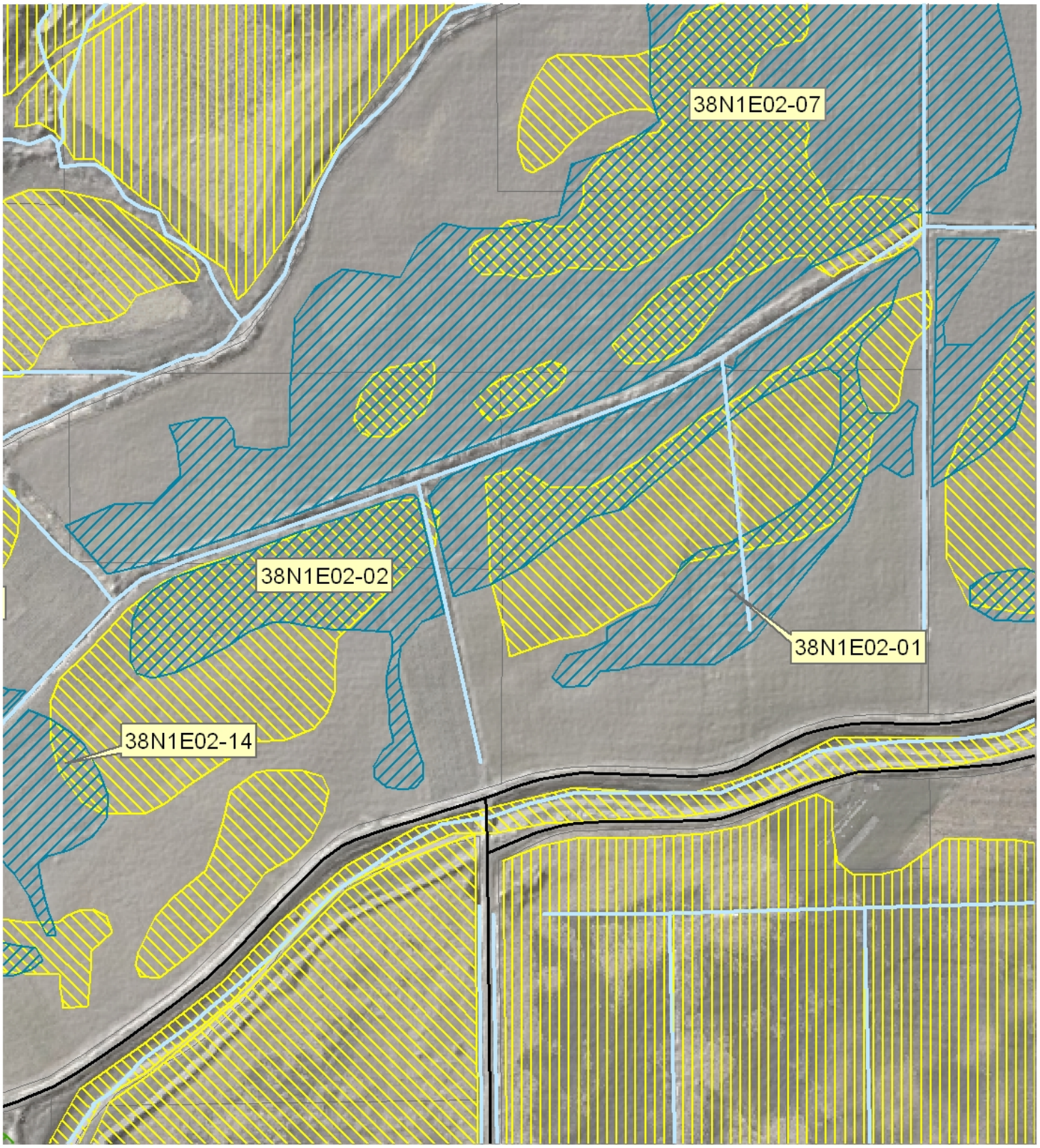
N

Wetlands
- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)

- Approximate Channel Location
- Parcels

0 250 500
Feet

38N1E02-01 and 38N1E02-02



N

Wetlands
- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)

Approximate Channel Location

Parcels

0 250 500
Feet

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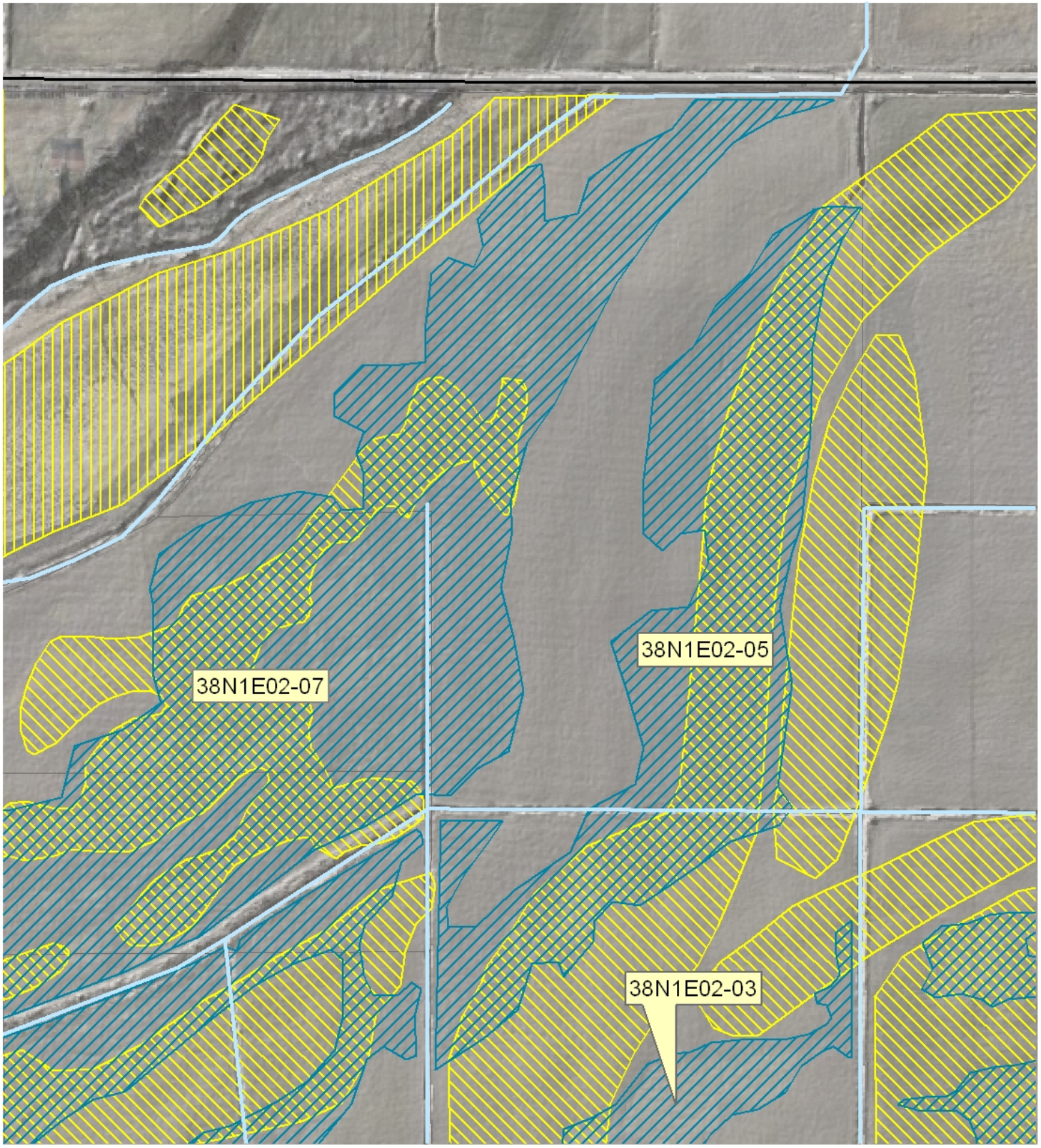
38N1E02-05



N

Wetlands
- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)
- Approximate Channel Location
- Parcels

0 250 500
Feet

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38N1E03-07

N

Wetlands

- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)
- Approximate Channel Location
- Parcels

0 250 500
Feet

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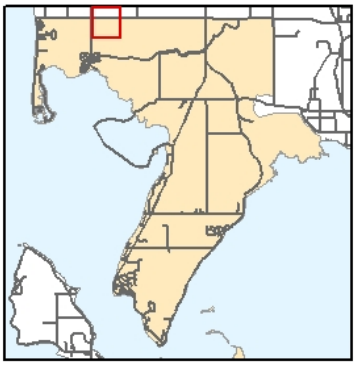

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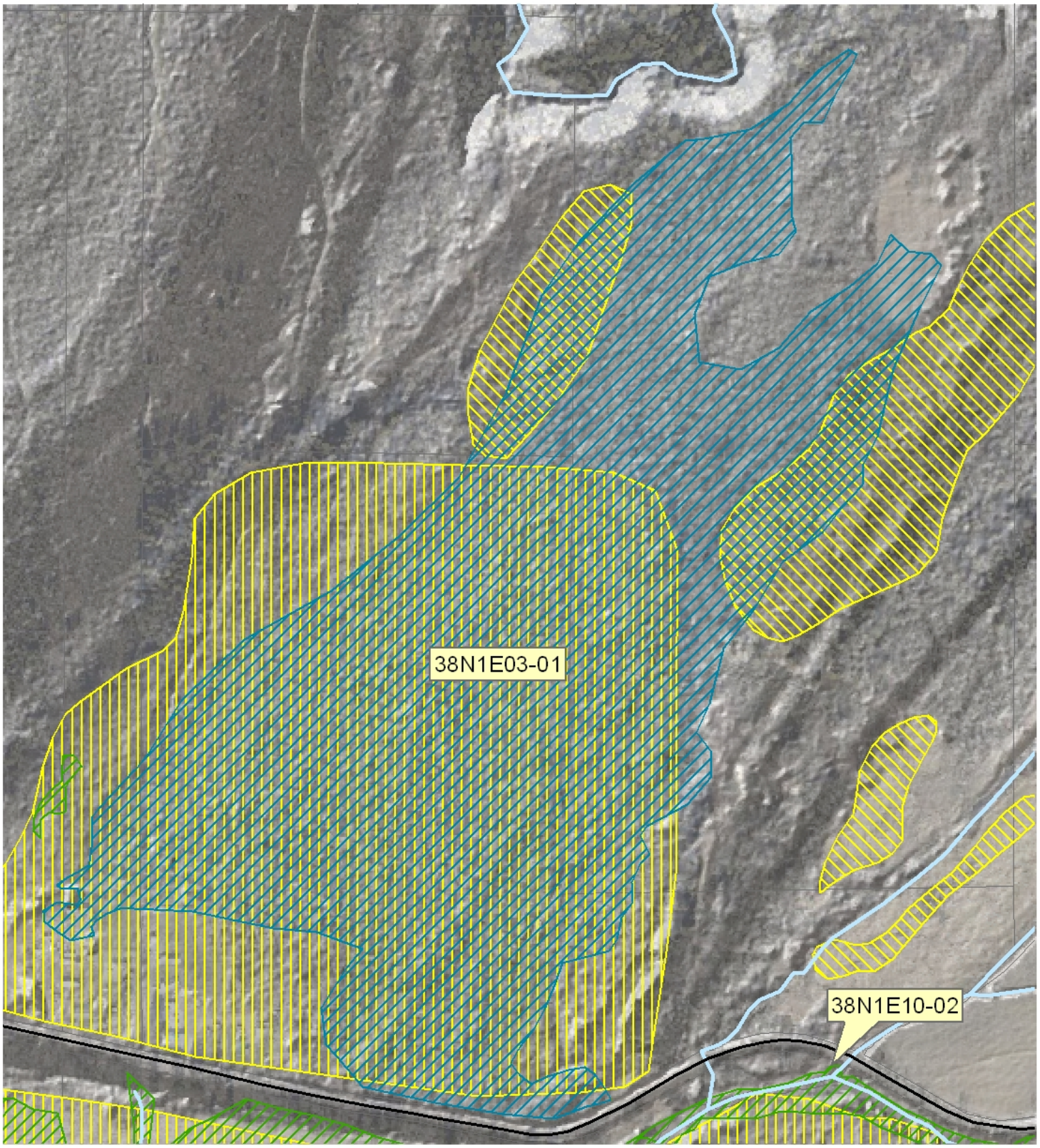

N

Wetlands
- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)

- Approximate Channel Location
- Parcels

0 250 500
Feet

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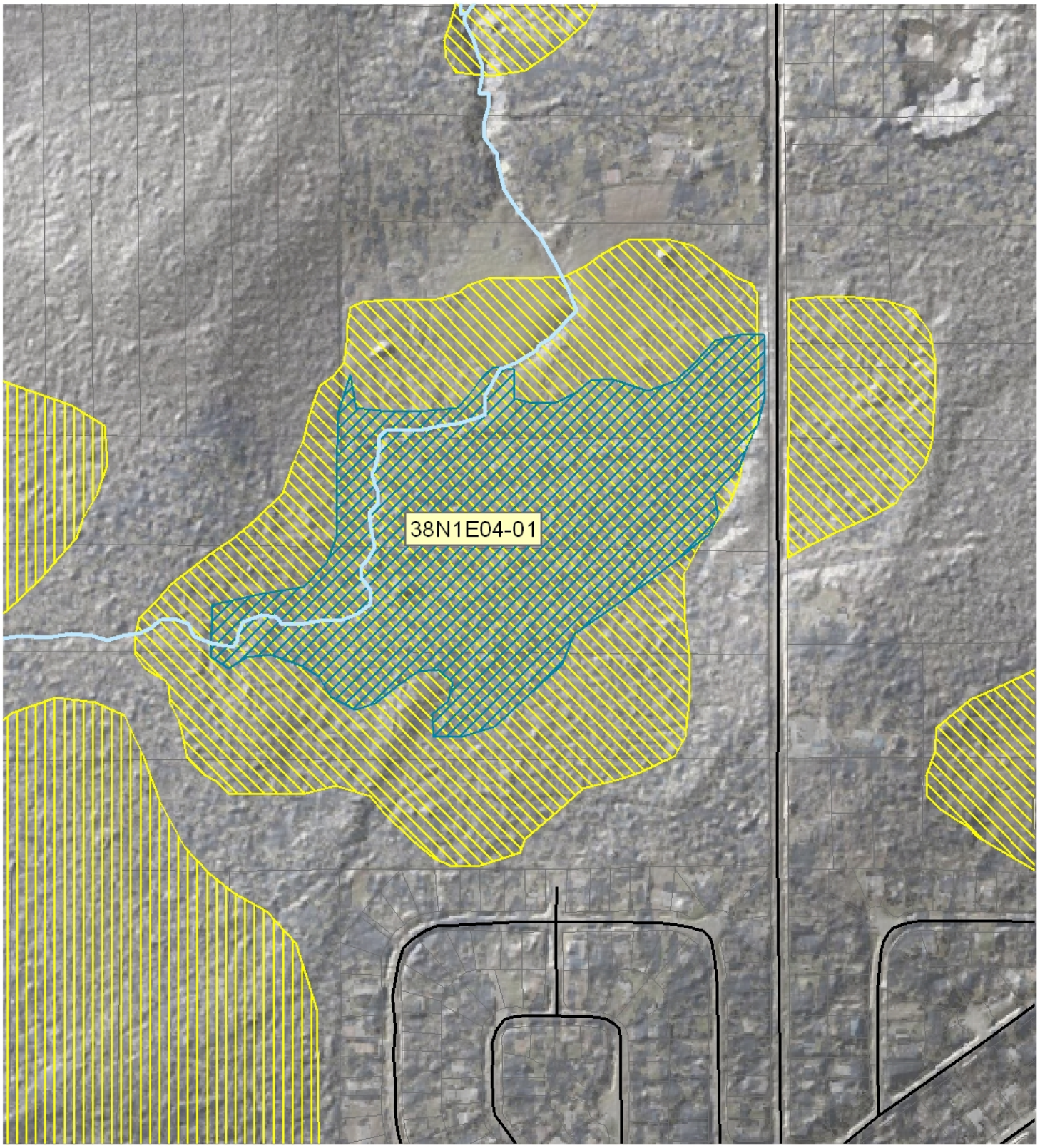
38N1E04-01



N

Wetlands

- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)
- Approximate Channel Location
- Parcels

0 250 500

Feet

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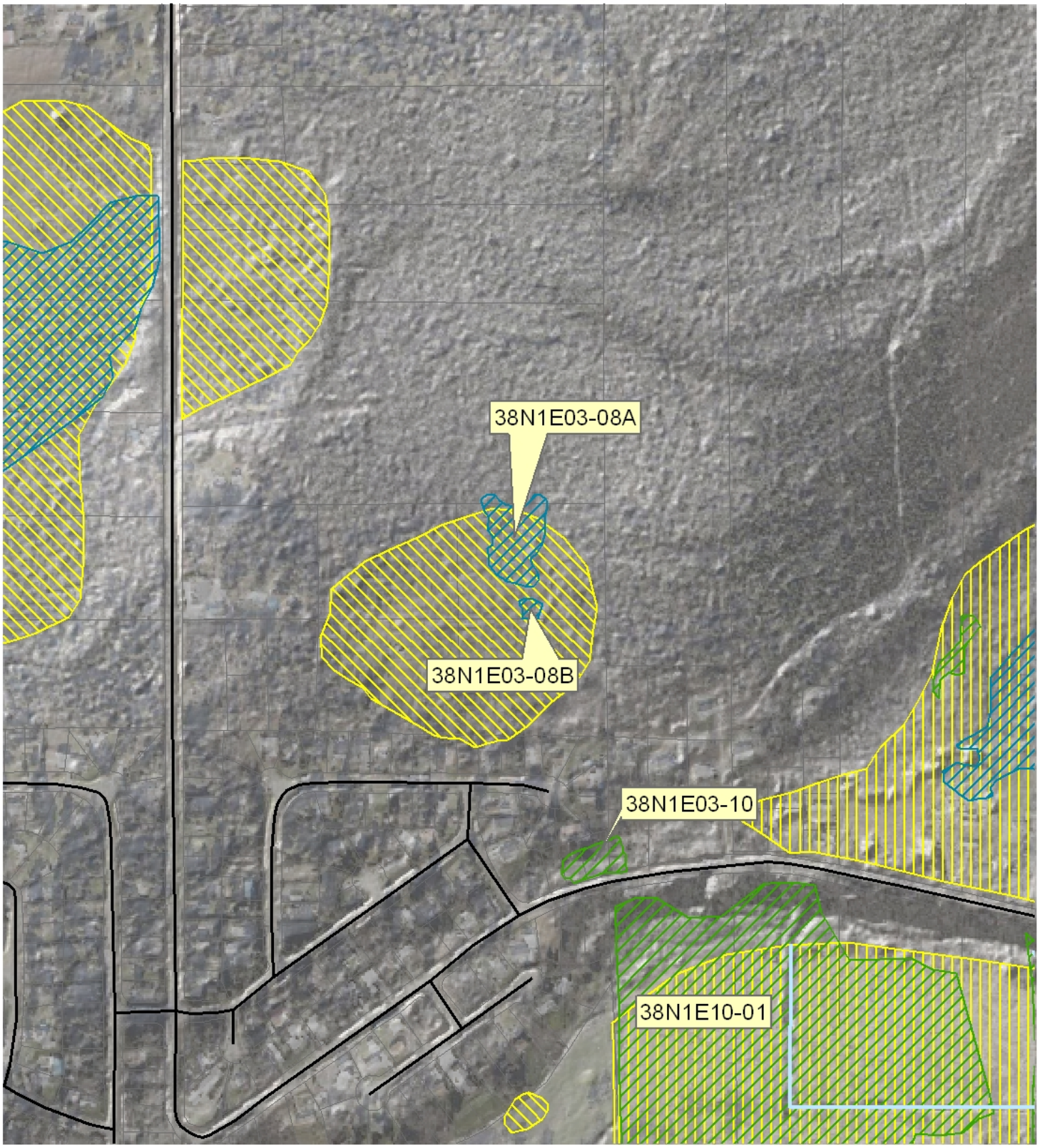
38N1E03-08A and 38N1E03-08B



N

Wetlands
- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)

- Approximate Channel Location
- Parcels

0 250 500
Feet

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38N1E04-06

N

Wetlands

- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)
- Approximate Channel Location
- Parcels

0 250 500

Feet

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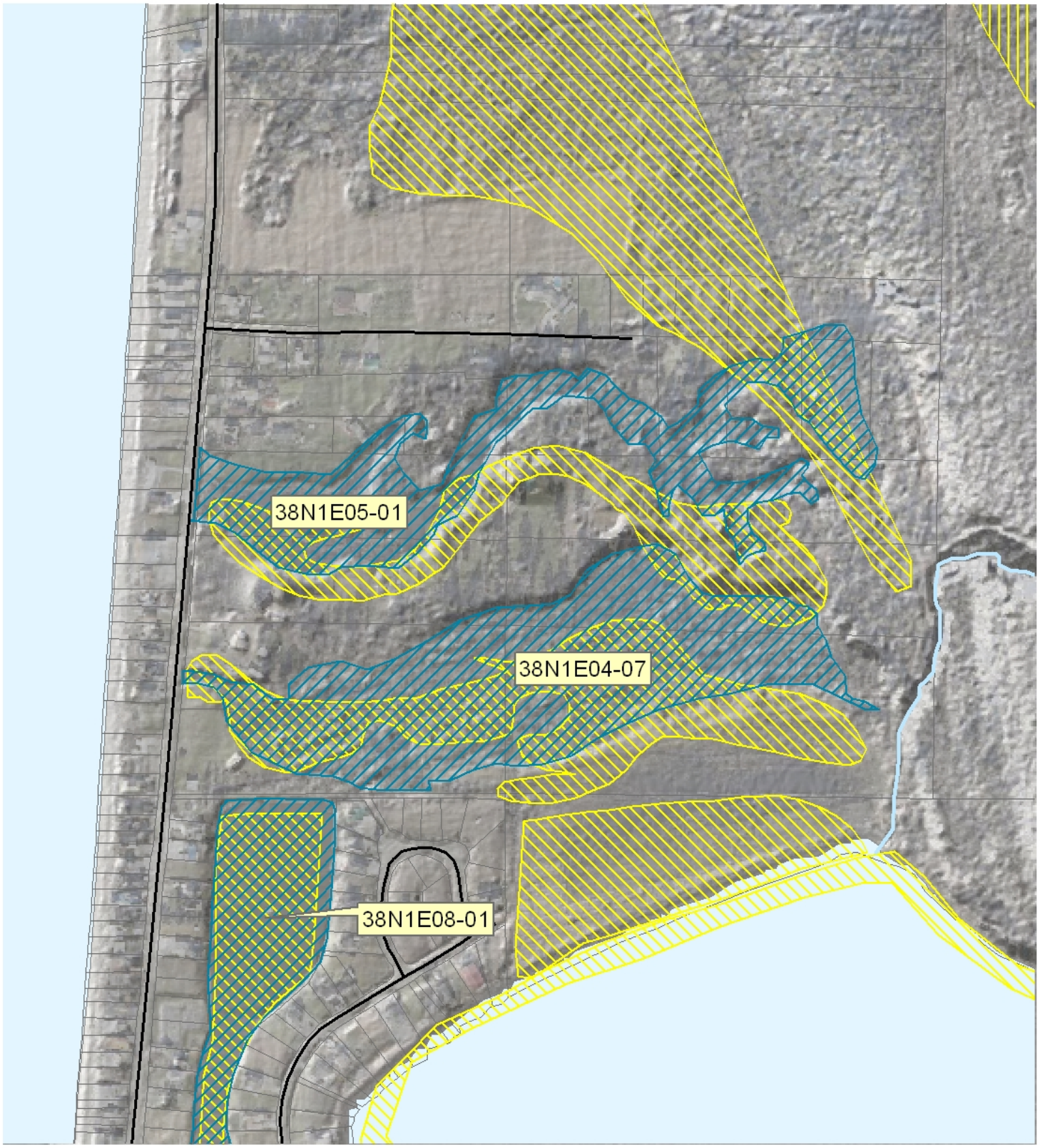
38N1E05-01 and 38N1E04-07



N

Wetlands
- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)
- Approximate Channel Location
- Parcels

0 250 500
Feet

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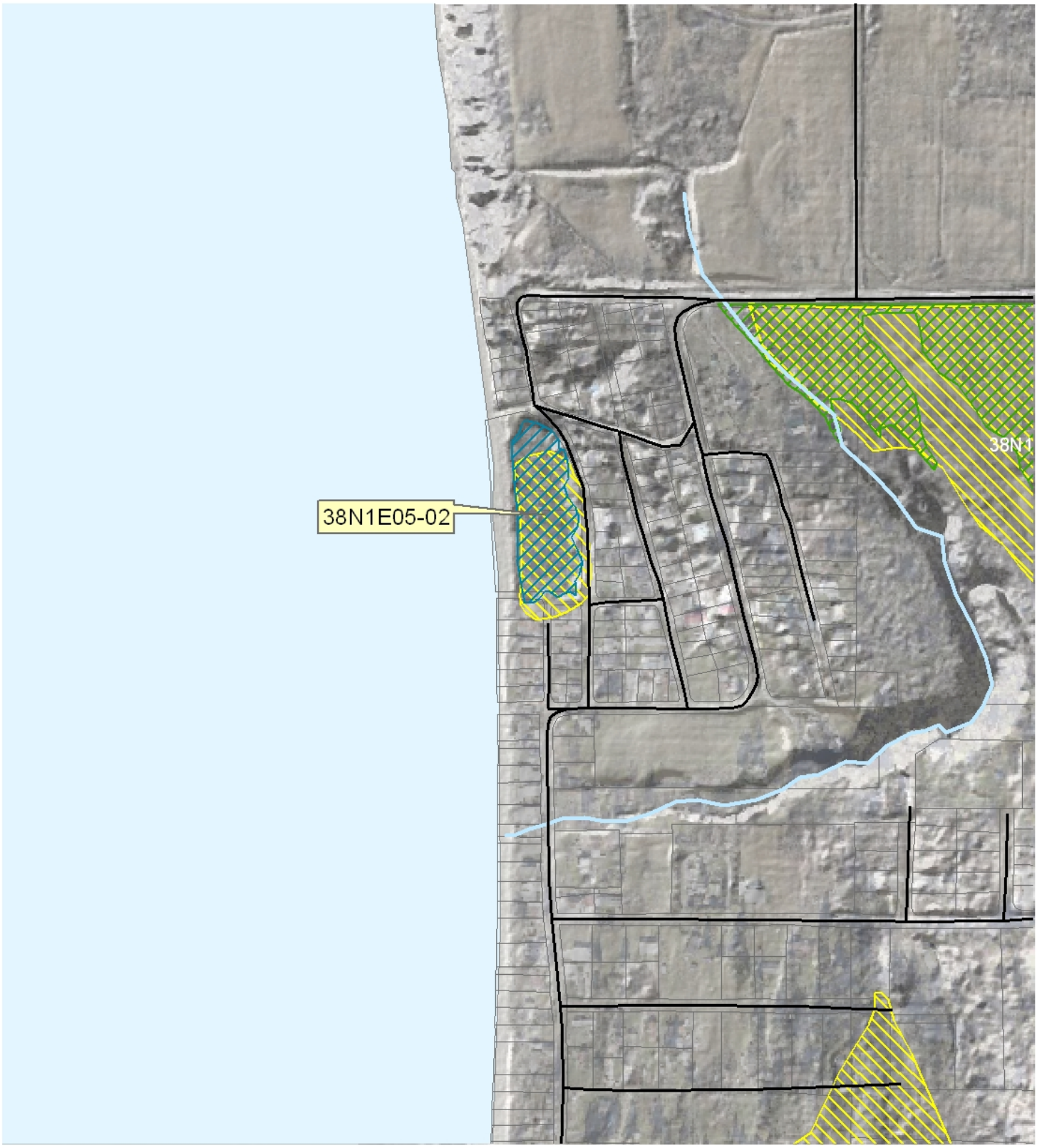
38N1E05-02



N

Wetlands
- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)

- Approximate Channel Location
- Parcels

0 250 500
Feet

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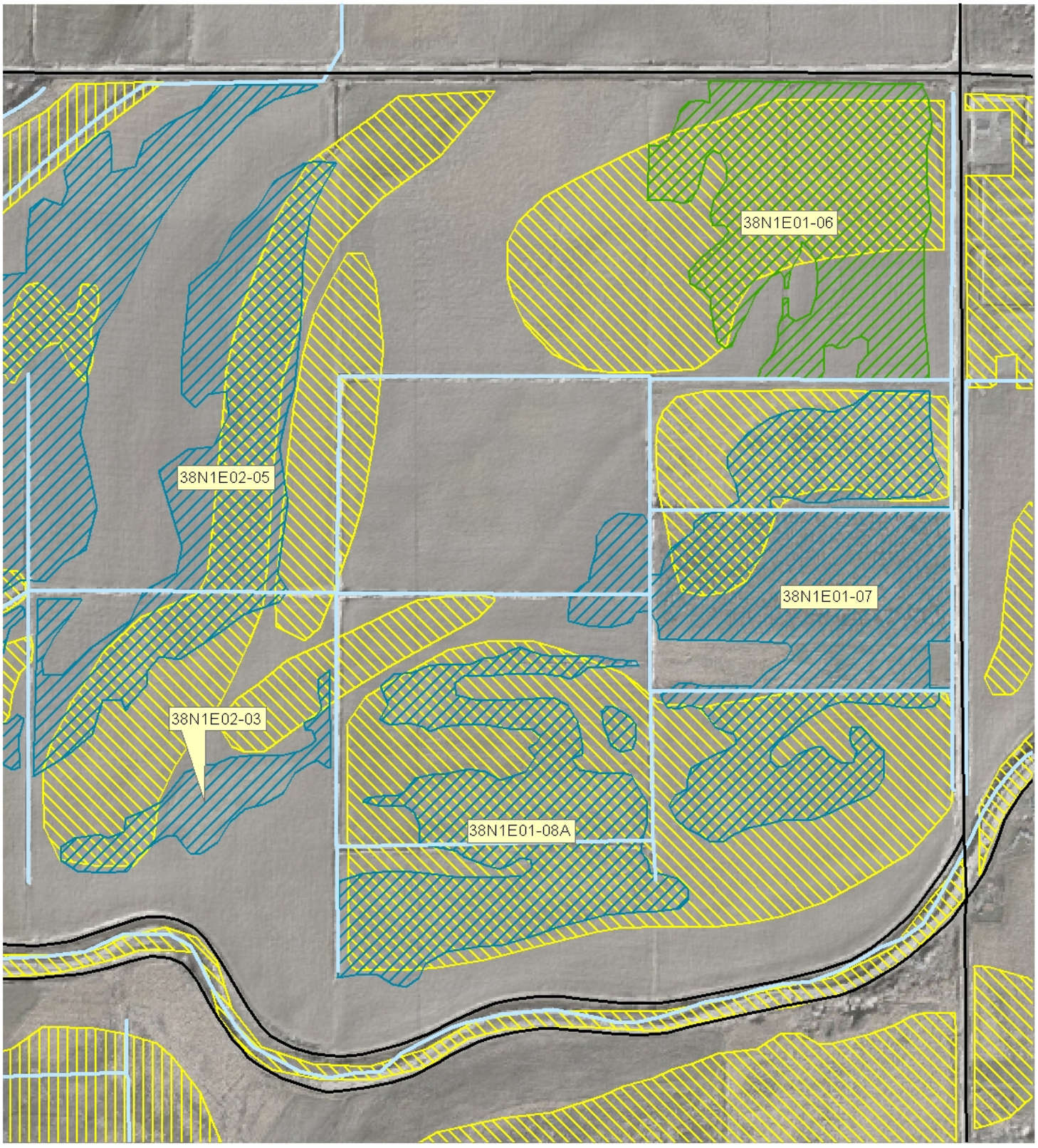
38N1E08-01 and 38N1E08-02

N

Wetlands
- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)
- Approximate Channel Location
- Parcels

0 250 500
Feet

38N1E01-07, 38N1E01-08A, and 38N1E02-03



N

Wetlands

- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)

Approximate Channel Location

0 250 500
Feet

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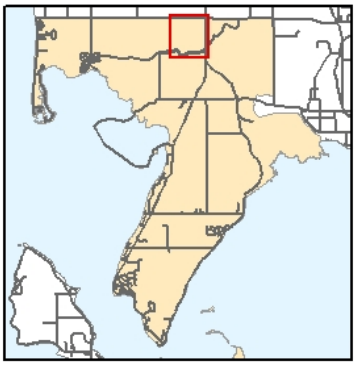

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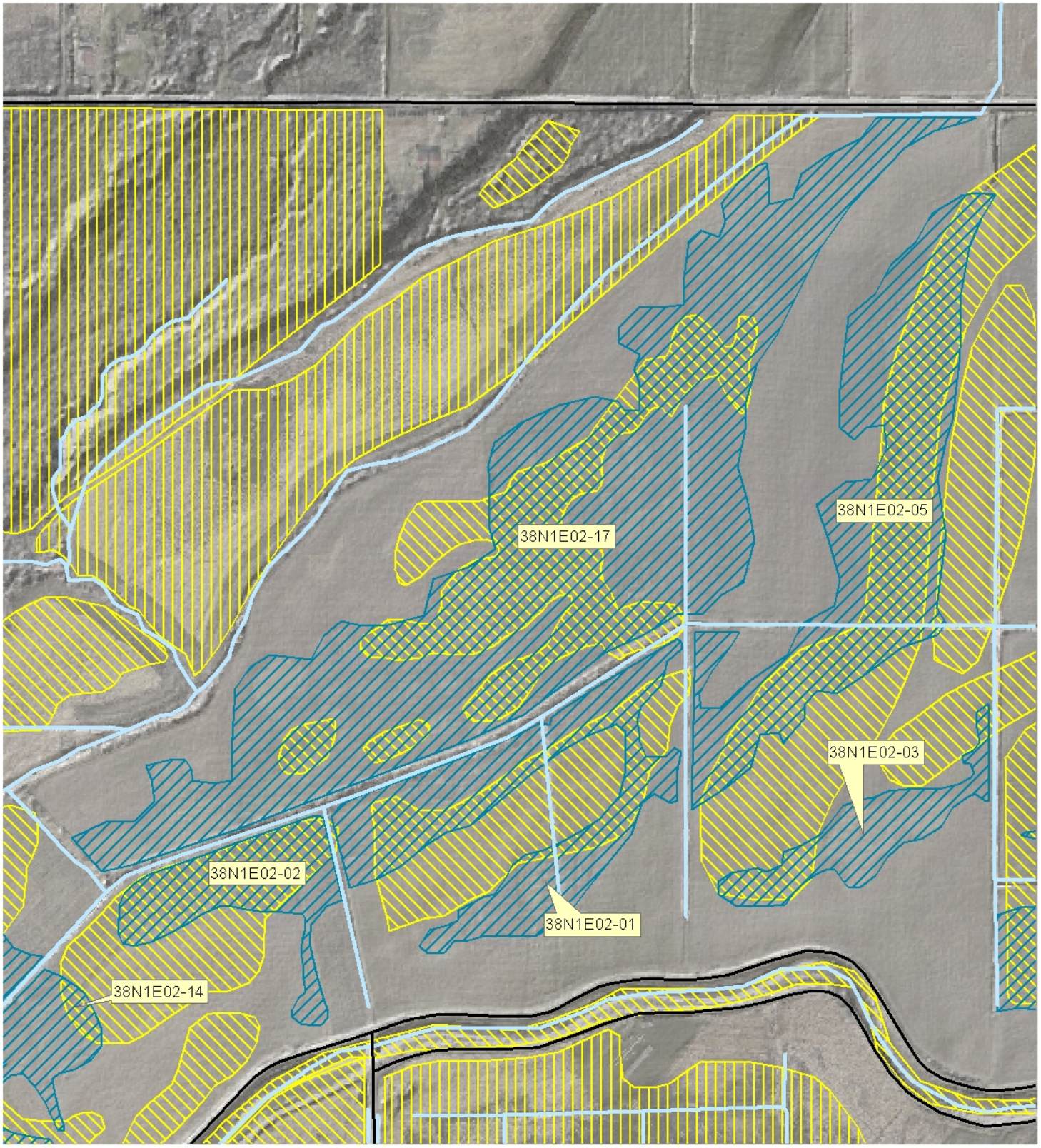

N

Wetlands

- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)

Approximate Channel Location

0 250 500
Feet

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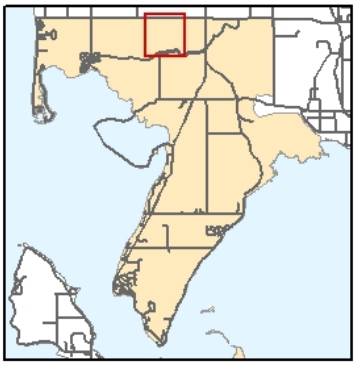
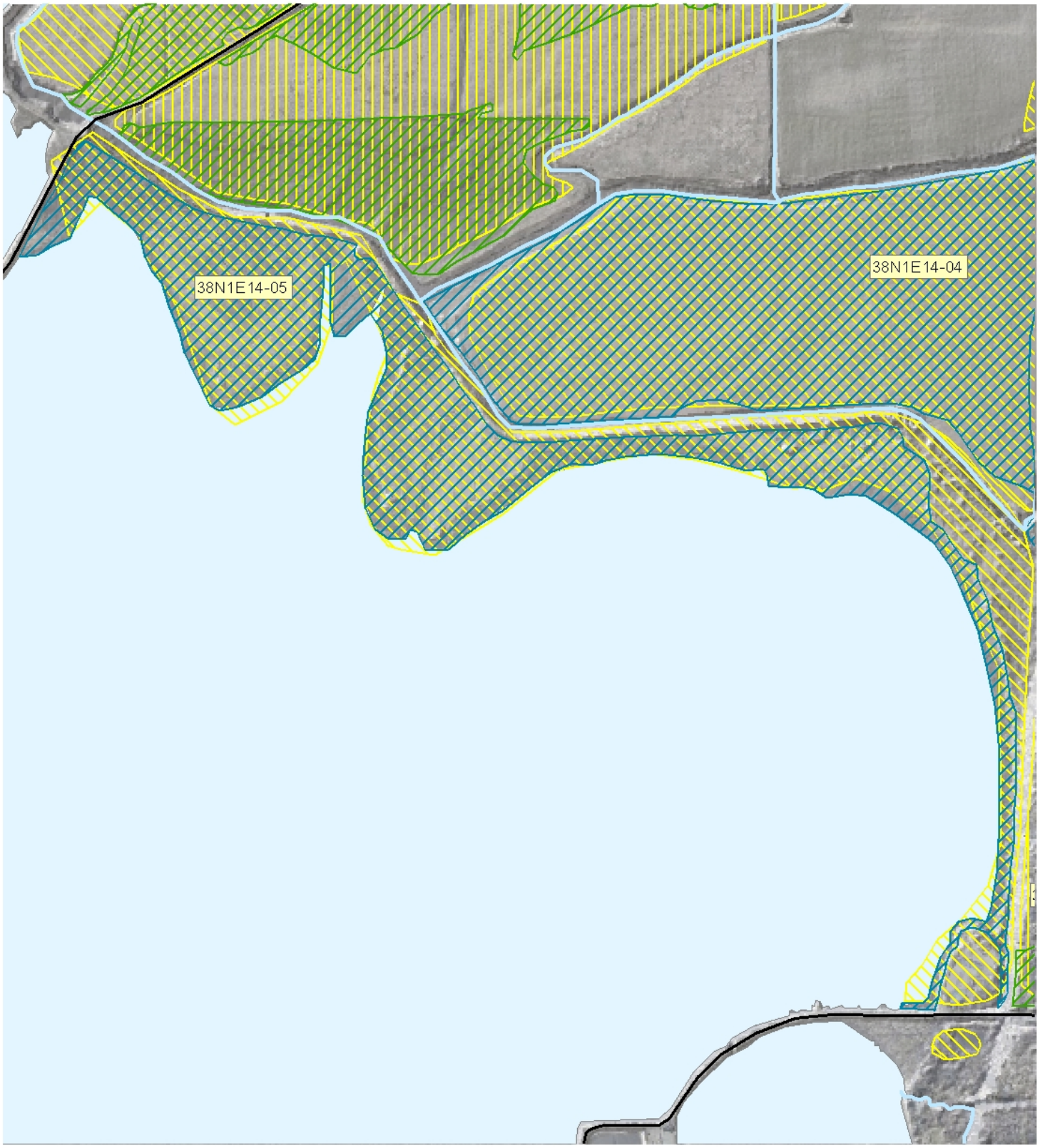


38N1E14-05



N

Wetlands

- Updated 2005
- Updated 2006
- Wetland (Estimated 1999)
- Wetland Complex (Estimated 1999)

Approximate Channel Location

0 250 500

Feet

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APPENDIX B – SAMPLE FIELD NOTES AND FUNCTION ASSESSMENT AND WETLAND RATING WORKSHEETS

Auto Recyclers #1

Watershed G
20

Wetland Name: 38N1E25-02 **AU ID#:** Same as name
Location: S. of Casey Rd, S. of auto recyclers, W. of Clearcut **T/S/R:** 38/1E/25
Data Collector: Lee First **Date:** 1/18/06

Use this data sheet for:
***DEPRESSIONAL CLOSED** wetlands*
in the Lowlands of Western Washington
- *Use in conjunction with the written guidance provided in Parts 1 and 2*
- *Record only numbers, yes/no answers are recorded as a [1] or [0]*

Estimate, Score/ or Rating			
			LANDSCAPE DATA 1.9 acres
0	1/0	**D0**	Do dikes surround the AU, and does it drain through a control structure that can be manipulated?
0.81	ha	**D1**	Area of AU 2 AC
10	ha	**D2**	Area of contributing basin (upgradient watershed)
		D3	Land use (as % of total area) within 1 km of AU (include contiguous AUs of different class)
20	%	*D3.1*	Undeveloped forest (if previously clear-cut, cut at least 5 years ago)
0	%	*D3.2*	Agriculture (tilled fields and pastures; includes golf courses)
10	%	*D3.3*	Clear-cut logging (<5 years since clearing)
5	%	*D3.4*	Urban/commercial (any developed areas not identified as residential) AUTO recycler
15	%	*D3.5*	High density residential (>1 residence/acre)
10	%	*D3.6*	Low density residential (<= 1 residence/acre)
40	%	*D3.7*	Undeveloped areas, shrubland, other wetlands, and open water
			WATER REGIME
		D4	
		D4.1	
		D4.2	
		D4.3	
		D5	
		D6	
		D7	
		D8	Inundation
15	%	*D8.1*	Percent of AU that is ponded or inundated for >1 month
0	%	*D8.2*	Percent of AU with permanent standing or moving water
0	%	*D8.3*	Percent of AU with permanent open water *(without aquatic bed vegetation)*
0	%	*D8.4*	Percent of AU with unvegetated bars or mudflats
0	0/1	*D8.5*	Unvegetated bars or mudflats at least 100 square meters in size
		D9	Inundation regimes
0	0/1	*D9.1*	Permanently flooded (include vegetated areas)
1	0/1	*D9.2*	Seasonally flooded (>1 month)
1	0/1	*D9.3*	Occasionally flooded (<= 1 month)
1	0/1	*D9.4*	Saturated but seldom inundated
0	0/1	*D9.5*	Permanently flowing stream
1	0/1	*D9.6*	Intermittently flowing stream
	m	**D10**	

Recent "site prep" on parcels E of this wetland has created a lot of standing water

Flow observed North to south but this wetland is NOT connected to 38N1E25-13

By definition:
D8.1 >= D8.2 >= D8.3

Chose all that apply that meet size criteria: area >0.1 ha (1/4 acre) or > 10% of AU if AU smaller than 1 ha (2.5 acres)

soil = Birchbay silt loam

Wetland Name: 38NIE25-02 **AU ID#:** same

		D11	
	0/1	*D11.1*	
	0/1	*D11.2*	
	0/1	*D11.3*	
		D12	Categories of water depths in AU, areas permanently or seasonally inundated/flooded
1	0/1	*D12.1*	1-20 cm (<8 in)
1	0/1	*D12.2*	20-100 cm (8-40 in)
0	0/1	*D12.3*	>100 cm (>40 in)
		D13	
		D13.1	
		D13.2	
		D13.3	
		D13.4	

Record a 1 for each category present if >0.1 ha (1/4 acre) or 10% of area

VEGETATION

		D14	Cowardin Classes (as % area of AU)
0	%	*D14.1*	Forest - evergreen
80	%	*D14.2*	Forest -deciduous
0	%	*D14.3*	Scrub-shrub - evergreen
20	%	*D14.4*	Scrub-shrub - deciduous
0	%	*D14.5*	Emergent
0	%	*D14.6*	Aquatic bed
1	0/1	**D15**	Does D8.3 + D8.4 + sum (D14.1 to D14.6) = 100? **If not, give reason.**
20	%	**D16**	% area of herbaceous understory **in forest and shrub areas** (not % area in entire AU)
15	%	**D17**	% area of AU with >75% closure of canopy *(SS, FO classes > 1 m high)*
		D18	
		D19	Plant Richness
16	#	*D19.1*	Record number of native plant species found in AU
1	#	*D19.2*	Record number of non- native plant species found in AU
4	#	**D20**	The # of plant assemblages in the AU with area >0.1 ha (1/4 acre) or >10% if AU <1 ha *(if more than 12 record a 12)*
3	[1-6]	**D21**	Strata: The maximum # of strata present in any plant assemblage
0	0/1	*D21.1*	Is vine stratum dominated by non-native blackberries?
1	0/1	**D22**	Mature trees in AU

- *Include forest only if trees are rooted in AU.*
- ***If forest is a mix of deciduous and evergreen estimate the relative % cover of each and divide percentage between the two categories.***
- ***If vegetation classes are patchy, add the patches together for each class to get a total.***
- *To count, a class must cover at least 0.1 ha or be more than 10% of the total area of the AU*

A stratum must have 20% cover in assemblage

Average DBH of 3 out of 5 largest trees of a species has to exceed size threshold

Tsuga heterophylla (western hemlock) >45 cm (18")
Thuja plicata (western red cedar) >45 cm (18")
Pseudotsuga menziesii (Douglas fir) >45 cm (18")
Picea sitchensis (Sitka spruce) >45 cm (18")
Populus balsamifera (black cottonwood) >45 cm (18")
Acer macrophyllum (big-leaf maple) >45 cm (18")
Alnus rubra (red alder) >30 cm (12")
Fraxinus latifolia (Oregon ash) >30 cm (12")
Pinus contorta (lodgepole pine) >30 cm (12")
Salix lucida (Pacific willow) >30 cm (12")

Wetland Name: 38NIE25-02 **AU ID#:** same

D23 Sphagnum bogs

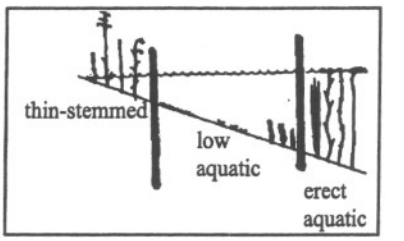
0 0/1 *D23.1* % area of Sphagnum bog >75%
0 0/1 *D23.2* % area of Sphagnum bog = 50-75%
0 0/1 *D23.3* % area of Sphagnum bog = 25-49%
0 0/1 *D23.4* % area of Sphagnum bog = 1-24%
1 0/1 *D23.5* % area of Sphagnum bog = 0%

D24 Dominance by non-native plant species

0 0/1 *D24.1* % area of non-native species >75%
0 0/1 *D24.2* % area of non-native species = 50-75%
0 0/1 *D24.3* %area of non-native species = 25-49%
1 0/1 *D24.4* % area of non-native species = 1-24%
0 0/1 *D24.5* % area of non-natives = 0%

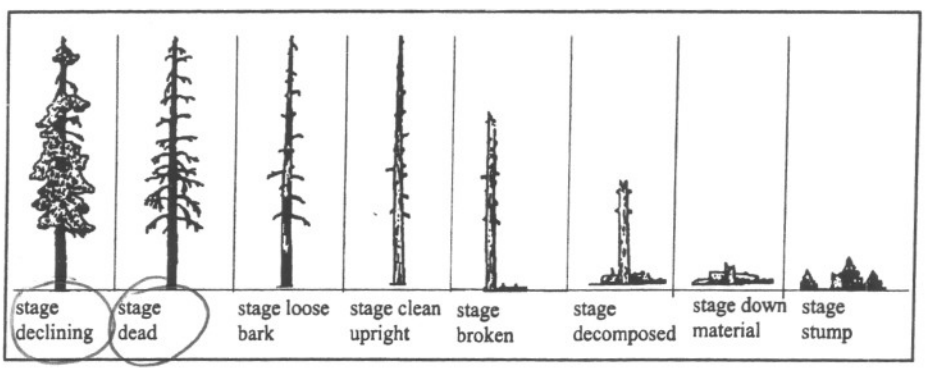
HABITAT CHARACTERISTICS

0 [0-3] **D25** Number of structure categories in aquatic bed vegetation
Applies only to aquatic bed species
DO NOT count persistent emergents



D26 pH

7 [4-9] *D26.1* pH of interstitial water *(measure immediately after digging hole in non-inundated areas)*
7 [4-9] *D26.2* pH of open or standing water (*record the lowest pH, if you cannot measure record a [7])*
1 0/1 **D27** Estuary: AU is within 8 km (5 mi) of a brackish or salt water estuary
0 0/1 **D28** Large lake: AU is within 1.6km (1 mi) of a lake >8 ha (20 acres)
1 0/1 **D29** Open field: AU is within 5 km (3 mi) of an open field (agriculture or pasture) >16 ha (40 acres)
1 0/1 **D30** Preferred woody vegetation: AU has >1 ha (2.5 acres) of preferred woody vegetation for beaver in and within 100 m of AU
2 [0-8] **D31** Snags (record # of stages)
Circle the categories present; minimum DBH of snag =10 cm (4")



0 0/1 *D31.1* At least one of the snags above has a DBH greater than 30 cm (12").

Wetland Name: 38N1E25-02 **AU ID#:** Same

1 0/1 **D32** Overhanging vegetation, extending out for 1m, for at least 10 m (33 ft) over stream or open water.

0 0/1 **D33** Upland islands of at least 10 square meters (100 square ft.) within AU boundary

Islands need to be surrounded by at least 30 m (100 ft) of open water deeper than 1 m (3 ft)

D34

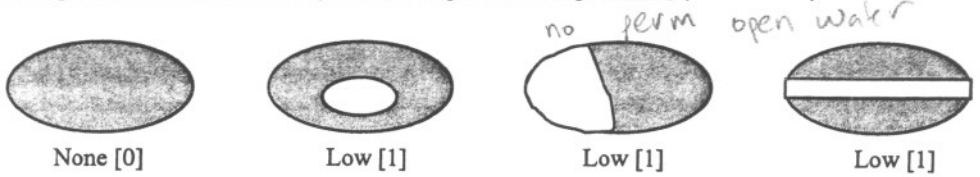
1 [0-4] **D35** Key for rating egg-laying structures for amphibians

1. Does the AU have thin-stemmed vegetation or thin branches **(<8 mm)** in at least 1/4 acre (or 10% of AU) of permanent or seasonally inundated areas? *Thin-stemmed vegetation can include herbaceous species such as water parsley.*
   NO – Score = 0 YES go to 2
2. Does the AU have at least 0.2 ha (1/2 acre) of thin-stemmed emergent vegetation or woody branches, **1-4 mm** in diameter?
   NO go to 5 YES go to 3
3. Does the area with thin stems contain open water interspersed in a patchwork of a ratio that is approximately 1:1 [no more than a 40- 60% of the total area is open water)?
   NO go to 4 **YES - Score = 4**
4. Is the area of open water between 25% and 75% of the total area in the zone of thin stemmed vegetation?
   NO – Score = 2 **YES – Score = 3** STOP
5. Does the AU have >0.1 ha (1/4 acre) of thin-stemmed emergent vegetation or woody branches, **1-4 mm**?
   NO – Score = 1 YES go to 6
6. Does the area with thin stems contain open water interspersed in a patchwork of a ratio that is approximately 1:1 [no more than a 40- 60% of the total area is open water)?
   NO go to 7 **YES – Score = 3**
7. Is the area of open water between 25% and 75% of the total area in the zone of thin stemmed vegetation?
   NO – Score = 1 **YES – Score = 2**

0 0/1 **D36** Tannins in surface waters >10% of water surface

0 0/1 **D37** Steep banks for denning (>30 degree slope, fine material, >10 m long, >0.6 m high) *(may be a dike)*

0 [0-3] **D38** Interspersion between erect vegetation and permanent open water (POW + AB) areas of AU



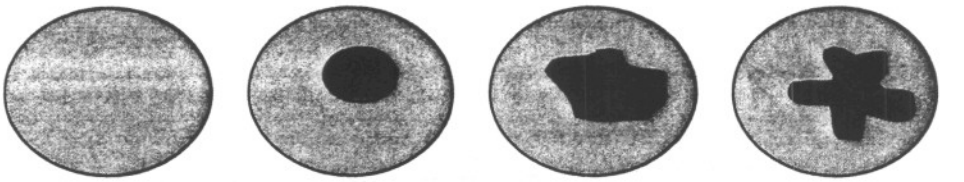
None [0] Low [1] Low [1] Low [1]

Moderate [2] Moderate [2] High [3] High [3]

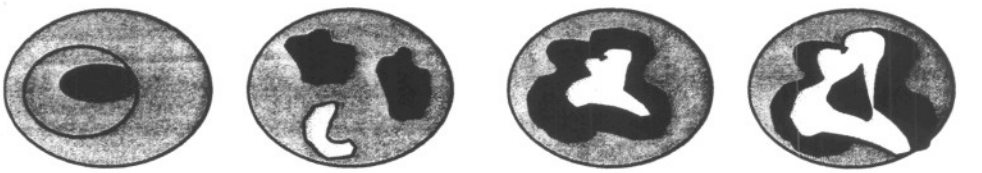
Wetland Name: 38NIE25-02 **AU ID#:** same

1 [0-3] **D39** Interspersion between Cowardin vegetation classes

**AUs with only 2 classes can only score a moderate [2] or lower*
**AUs with 4 vegetation classes score a high [3]*
**AUs with 3 classes can score a moderate (2) or a high (3)*



None [0] Low [1] Low [1] Moderate [2]



Moderate [2] High [3] High [3] High [3]

D40

1 [0-3] **D41** Edge of AU: The characteristics of the edge between AU and uplands or adjacent wetlands.

Choose the description that best fits the characteristics of the AU edge:

0 There are **no differences in level** of vegetation height as reflected by vegetation classes on each side of the AU for more than 50% of the circumference: record a [0] **regardless of the sinuosity**. Examples: emergent (or herbaceous) to emergent (or herbaceous), shrub to shrub, forest to forest.

1 There is a **difference of one level** in vegetation height as reflected by vegetation classes on each side of the AU and the **edge is straight** for more than 50% of the circumference: record a [1]. Example: emergent (or herbaceous) to shrub, shrub to forest

2 There is a **difference of one level** in vegetation height as reflected by vegetation classes on each side of the AU and the **edge is sinuous** for more than 50% of the circumference: record a [2]. Examples: emergent (or herbaceous) to shrub, shrub to forest.

2 There is a **difference of more than one level** of vegetation height as reflected by vegetation classes on each side of the AU and the **edge is straight: record a [2]**. Examples: emergent (or herbaceous) to forest, bryophytes to scrub/shrub or forest.

3 There is a **difference of more than one level** of vegetation height as reflected by vegetation classes on each side of the AU and the **edge is sinuous: record a [3]**. Example: emergent (or herbaceous) to forest, bryophytes to scrub/shrub or forest.

2 If **no single category** above extends for more than 50% of the circumference, and the **edge is straight: record a [2]**

3 If **no single category** above extends for more than 50% of the circumference, and the **edge is sinuous: record a [3]**

Wetland Name: 38NIE25-02 **AU ID#:** Same

V [0-5] **D42** Buffer of AU: Choose the description that best represents condition of AU buffer

> * *Open water or adjacent wetlands are considered part of the buffer*
> * *Infrequently used gravel or paved roads or vegetated dikes in a relatively undisturbed buffer can be ignored as a "disturbance"*

5 100 m (330 ft) of forest, scrub, relatively undisturbed grassland or open water >95% of circumference. Clear-cut >5 years old is OK. No developed areas within undisturbed part of buffer.

4 100 m (330 ft) of forest, scrub, relatively undisturbed grassland or open water >50% circumference OR 50 m (170 ft) of forest scrub, grassland or open water >95% circumference. No developed areas within undisturbed part of buffer.

3 100 m (330 ft) of forest, scrub, grassland or open water >25% circumference, OR 50 m (170 ft) of forest, scrub, grassland or open water >50% circumference.

2 No paved areas or buildings within 25m (80 ft) of wetland >95% circumference. Pasture or lawns are OK. OR no paved areas or buildings within 50m of wetland >50% circumference

0 Vegetated buffers are <2 m wide (6.6 ft) for more than 95% of the circumference

1 Does not meet any of the criteria above

V [0-3] **D43** Corridors of AU: Rate corridors using following key *(record rating of 0, 1, 2, or 3)*

1. Is the AU part of a riparian corridor *(see text for definitions)*
   NO go to 5 **YES go to 2**
2. Is the wetland part of riparian corridor >50 m wide connecting 2 or more wetlands within 1 km with at least 30% shrub or forest cover in the corridor?
   NO go to 3 **YES = [3]**
3. Is the AU part of a riparian corridor 25-50 m wide connecting to other wetlands with at least 30% shrub or forest cover in the corridor?
   NO go to 4 **YES = [2]**
4. Is the AU part of a riparian corridor >5 m wide with relatively undisturbed veg. (grasslands, abandoned pasture are OK) that extends for more than 1 km?
   NO go to 5 **YES = [1]**
5. Is there a corridor >50 m wide with good (>30%) cover of forest or shrub (>2 m high) to natural upland area or open water that is >100 ha in size?
   NO go to 6 **YES = [3]**
6. Is there a 10-50 m wide forest or shrub corridor to a relatively undisturbed upland or open water that is >10 ha?
   NO go to 7 **YES = [2]**
7. Is there a corridor of relatively undisturbed vegetation (grassland, abandoned pasture) >50 m wide to an undisturbed upland or open water that is >10 ha?
   NO go to 8 **YES = [2]**
8. Is there any vegetated corridor 5-50 m wide between the AU and any relatively undisturbed area or open water that is >2.5 ha?
   NO = [0] **YES = [1]**

Wetland Name: 38N1E25-02 **AU ID#:** Same

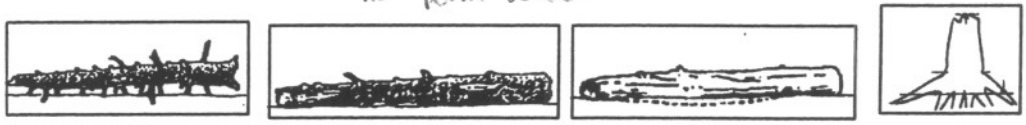
4 [0-12] **D44** # of categories of large woody debris in AU **outside of perm. water**

Freshly cut stumps are not included

Diameter		Log Class 1	Log Class 2	Log Class 3	Stump
10-20cm	(4-8")	✓	✓		✓
21-50cm	(8-20")		✓		
>50 cm	(>20")				

0 [0-12] **D45** # of categories of large woody debris **in permanent water** of AU (may include aquatic bed areas)

no perm water



Diameter		Log Class 1	Log Class 2	Log Class 3	Stump
10-20cm	(4-8")				
21-50cm	(8-20")				
>50 cm	(>20")				

SOILS and SUBSTRATES

D46 Composition of AU surface

1	0/1	*D46.1*	Deciduous, broad-leaved, leaf litter
1	0/1	*D46.2*	Other plant litter
1	0/1	*D46.3*	Decomposed organic
0	0/1	*D46.4*	Exposed cobbles
0	0/1	*D46.5*	Exposed gravel
0	0/1	*D46.6*	Exposed sand
0	0/1	*D46.7*	Exposed silt
0	0/1	*D46.8*	Exposed clay

Record a 1 for each category present if its area is > 10 square meters. Note: bare earth from animal tunnels does NOT count.

D47 Soils present in top (15 cm) of A horizon (record [1] if 1-49% area of AU, [2] if 50-95%, [3] if >95%)

0	[0-3]	*D47.1*	Peat
1	[0-3]	*D47.2*	Organic Muck
2	[0-3]	*D47.3*	Mineral with clay fraction <30%
0	[0-3]	*D47.4*	Clay (clay fraction >30%)

Record the least permeable layer if there are several down to 60 cm.

Wetland Name: 38NE25-02 **AU ID#:** SamC

		D48	Infiltration rate of top 60 cm of soil in seasonally inundated areas
0	0/1	*D48.1*	Fast >50% gravel and cobble and the rest a sand, loamy sand, or sandy loam
0	0/1	*D48.2*	Moderate >50% sand and rest cobble, gravel, loamy sand, or sandy loam
1	0/1	*D48.3*	Slow - muck, peat, or loams (except sandy loam), silts, and clays
		D49	
		D49.1	
		D49.2	
		D49.3	

Judgements of Opportunity (Ratings of High, Medium, Low)

Rating	*Functions*
M	Removing Sediments
M	Removing Nutrients
M	Removing Toxic Metals and Organics
M	Reducing Peak Flows
L	Reducing Downstream Erosion
H	Recharging Groundwater
M	General Habitat
L	Anadromous Fish Habitat

Western Washington Wetland Classification Key

Wetland Name: 38NIE25-02 (S. of Cosgy Rd, S. of Auto Recyclers)
AU ID #: Auto Recyclers #2 **Date:** 1/23/06

1) Water levels in AU usually controlled by tides
(No) – go to 2 Yes – **Tidal Fringe**

2) Topography is flat and precipitation is only source (>90%) of water to the AU
(No) – go to 3 Yes – **Flat**

3) AU is contiguous with >8 ha open water, and water is deeper than 2 m over 30% of open water area
(No) – go to 4 Yes – **Lacustrine Fringe**

4) Open water is <8 ha and >2 m deep, but AU is a fringe narrower than ½ the radius of open water
(No) – go to 5 Yes – **Lacustrine Fringe**

5) Water flow in AU is unidirectional on a slope, water is not impounded in the AU
(No) – go to 6 Yes – **Slope**

6) AU is located in a topographic valley with stream or river in the middle
(No) – go to 9 (Yes) – go to 7 ?

7) Have data showing area flooded more than once every 2 yrs.; or indicators of flooding are present:
- ☐ Scour marks common no
- ☐ Recent sediment deposition no
- ☐ Vegetation that is damaged or bent in one direction perhaps
- ☐ Soils have alternating deposits
- ☐ Vegetation along bank edge has flood marks

No for all indicators – go to 9 Yes for any indicator – go to 8

8) Flood waters retained
No – **Riverine Flow-through**
Yes – **Riverine Impounding**
- ☐ Depression in floodplain
- ☐ Constricted outlet
- ☐ Permanent water

9) Has surface water outflow – **Depressional Outflow**
Has no surface outflow – **Depressional Closed**

Rationale for Choices:
NO OUTFLOW)

DEPRESSIONAL

WETLAND RATING FORM – WESTERN WASHINGTON

Name of wetland (if known): 38N1E25-02

Location: SEC: 25 TWNSHP: 38 RNGE: 1E (attach map with outline of wetland to rating form)

Person(s) Rating Wetland: Lee First Affiliation: LNR Date of site visit: 1/18/06

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III✓ IV___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	16
Score for Hydrologic Functions	10
Score for Habitat Functions	17
TOTAL score for functions	33

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply✓

Final Category (choose the "highest" category from above) III

Check the appropriate type and class of wetland being rated.

Wetland Type		Wetland Class	
Estuarine		Depressional	✓
Natural Heritage Wetland		Riverine	
Bog		Lake-fringe	
Mature Forest		Slope	
Old Growth Forest		Flats	
Coastal Lagoon		Freshwater Tidal	
Interdunal			
None of the above			

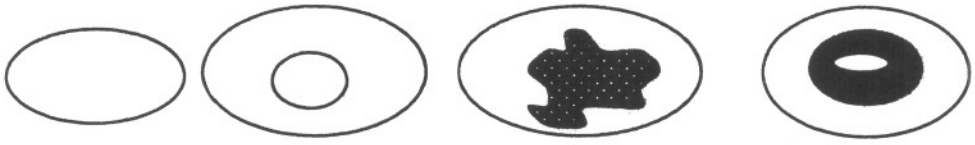
D	Depressional and Flats Wetlands	Points
	WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality	
D	**D 1. Does the wetland have the potential to improve water quality?** *(see p. 38)*	
D	D 1.1 Characteristics of surface water flows out of the wetland: Wetland is a depression with no surface water outlet — points = (3) Wetland has an intermittently flowing, or highly constricted, outlet — points = 2 Wetland has an unconstricted surface outlet — points = 1 Wetland is flat and has no obvious outlet and/or outlet is a ditch — points = 1	3
D	D 1.2 The soil 2 inches below the surface is clay, organic, or smells anoxic (hydrogen sulfide or rotten eggs). YES — points = 4 NO — points = 0	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest class): Wetland has persistent, ungrazed, vegetation > = 95% of area — points = 5 Wetland has persistent, ungrazed, vegetation > = 1/2 of area — points = 3 Wetland has persistent, ungrazed vegetation > = 1/10 of area — points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area — points = 0	3
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* Area seasonally ponded is > ½ total area of wetland — points = 4 Area seasonally ponded is > ¼ total area of wetland — points = 2 Area seasonally ponded is < ¼ total area of wetland — points = 0 NOTE: *See text for indicators of seasonal and permanent inundation..*	2
D	**Total for D 1** *Add the points in the boxes above*	8
D	**D 2. Does the wetland have the opportunity to improve water quality?** *(see p. 44)* Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants.* — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ **YES** multiplier is (2) **NO** multiplier is **1**	multiplier 2
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	16

D	Depressional and Flats Wetlands	Points
	HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream degradation	
	D 3. Does the wetland have the <u>potential</u> to reduce flooding and erosion? *(see p. 46)*	
D	D 3.1 Characteristics of surface water flows out of the wetland Wetland has no surface water outlet points = 4 Wetland has an intermittently flowing, or highly constricted, outlet points = 2 Wetland is flat and has no obvious outlet and/or outlet is a small ditch points = 1 Wetland has an unconstricted surface outlet points = 0	4
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet* Marks of ponding are 3 ft or more above the surface points = 7 The wetland is a "headwater" wetland" points = 5 Marks of ponding between 2 ft to < 3 ft from surface points = 5 Marks are at least 0.5 ft to < 2 ft from surface points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft points = 0	3
D	D 3.3 Contribution of wetland to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland itself.* The area of the basin is less than 10 times the area of wetland points = 5 The area of the basin is 10 to 100 times the area of the wetland points = 3 The area of the basin is more than 100 times the area of the wetland points = 0 Wetland is in the FLATS class (basin = the wetland, by definition) points = 5	3
D	**Total for D 3** *Add the points in the boxes above*	10
D	**D 4. Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** *(see p. 49)* Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — Wetland drains to a river or stream that has flooding problems — Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	10

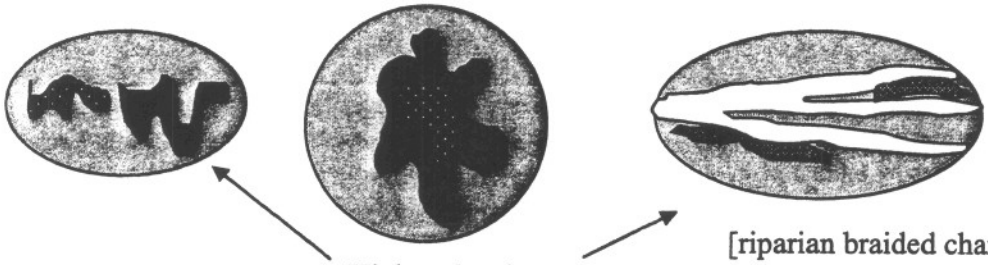
These questions apply to wetlands of all HGM classes.	**Points**
HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat	
H 1. Does the wetland have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Vegetation structure</u> ***(see p. 72)*** *Check the types of vegetation classes present (as defined by Cowardin) if the class covers more than 10% of the area of the wetland or ¼ acre.* ____Aquatic bed __✓__Emergent plants __✓__Scrub/shrub (areas where shrubs have >30% cover) __✓__Forested (areas where trees have >30% cover) ____Forested areas have 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) *Add the number of vegetation types that qualify. If you have:* 4 types or more points = 4 3 types points = 2 2 types points = 1 1 type points = 0	2
H 1.2. <u>Hydroperiods</u> ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 __✓__Seasonally flooded or inundated — 3 types present — points = 2 __✓__Occasionally flooded or inundated — 2 types present — point = 1 __✓__Saturated only ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland* = 2 points** ____***Freshwater tidal wetland* = 2 points**	2
H 1.3. <u>Richness of Plant Species</u> ***(see p. 75)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle* If you counted: > 19 species points = 2 *List species below if you want to:* (5 - 19 species) points = 1 < 5 species points = 0	1

H 1.4. Interspersion of habitats *(see p. 76)*

Decide from the diagrams below whether interspersion between types of vegetation (described in H 1.1), or vegetation types and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.



None = 0 points Low = 1 point Moderate = 2 points



High = 3 points [riparian braided channels]

NOTE: If you have four or more vegetation types or three vegetation types and open water the rating is always "high".

1

H 1.5. Special Habitat Features: *(see p. 77)*

Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.

✓ Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).

✓ Standing snags (diameter at the bottom > 4 inches) in the wetland

____ Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream for at least 33 ft (10m)

____ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present

____ At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. *(structures for egg-laying by amphibians)*

____ Invasive plants cover less than 25% of the wetland area in each stratum of plants

2

H 1. TOTAL Score - potential for providing habitat
Add the scores in the column above

3

Comments

H 2. Does the wetland have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No developed areas within undisturbed part of buffer. **(relatively undisturbed also means no-grazing)** **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1**	3
H 2.2 Corridors and Connections *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 82)*

Which of the following priority habitats are within 330ft (100m) of the wetland?
(see text for a more detailed description of these priority habitats)

____**Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.8 ha (2 acres).

____**Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.

____**Old-growth forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age.

____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.

____**Prairies:** Relatively undisturbed areas (as indicated by dominance of native plants) where grasses and/or forbs form the natural climax plant community.

____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

____**Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages

____**Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%. Eagle

____**Urban Natural Open Space**: A priority species resides within or is adjacent to the open space and uses it for breeding and/or regular feeding; and/or the open space functions as a corridor connecting other *priority habitats*, especially those that would otherwise be isolated; and/or the open space is an isolated remnant of natural habitat larger than 4 ha (10 acres) and is surrounded by urban development.

____**Estuary/Estuary-like:** Deepwater tidal habitats and adjacent tidal wetlands, usually semi-enclosed by land but with open, partly obstructed or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines there is appreciable dilution of sea water. Estuarine habitat extends upstream and landward to where ocean-derived salts measure less than 0.5ppt. during the period of average annual low flow. Includes both estuaries and lagoons.

____**Marine/Estuarine Shorelines**: Shorelines include the intertidal and subtidal zones of beaches, and may also include the backshore and adjacent components of the terrestrial landscape (e.g., cliffs, snags, mature trees, dunes, meadows) that are important to shoreline associated fish and wildlife and that contribute to shoreline function (e.g., sand/rock/log recruitment, nutrient contribution, erosion control).

If wetland has **3 or more** priority habitats = **4 points**
If wetland has **2** priority habitats = **3 points**
If wetland has **1** priority habitat = **1 point** No habitats = 0 points

1

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores in the column above*	8
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	17

Does the wetland being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That Need Special Protection, and That Are Not Included in the Rating	YES	NO
SP1. *Has the wetland been documented as a habitat for any Federally listed Threatened or Endangered plant or animal species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		
SP2. *Has the wetland been documented as habitat for any State listed Threatened or Endangered plant or animal species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database.		
SP3. *Does the wetland contain individuals of Priority species listed by the WDFW for the state?*		
SP4. *Does the wetland have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

1/20/06 AutoRecyclers #1.
SPECIES LIST 38N1E25-02

western crabapple
alder
salmonberry
moss
lady fern
indian plum
vine maple
sitka spruce
water parsley
youth-on-age
nettles
skunk cabbage
lady fern
equisetum
cedar
* blackberry - I
elderberry

assemblages

crabapple/v maple
salmonberry/elderb
water parsley/skunk
alder/vine maple

large trees =
Alder
water flowing [illegible]

small amt. W
near water

a couple dead [illegible]
[illegible]
[illegible]

Invasives = 1
Natives = 16

SITE 38N1E25-02 #AU- 0

Depressional Closed

Summary of Function Assessments

Function	Index
Potential for Removing Sediment	10
Potential for Removing Nutrients	8
Potential for Removing Heavy Metals and Toxic Organics	3
Potential for Reducing Peak Flows	10
Potential for Reducing Decreasing Downstream Erosion	10
Potential for Groundwater Recharge	2
General Habitat Suitability	5
Habitat Suitability for Invertebrates	4
Habitat Suitability for Amphibians	2
Habitat Suitability for Anadromous Fish	N/A
Habitat Suitability for Resident Fish	N/A
Habitat Suitability for Wetland Associated Birds	4
Habitat Suitability for Wetland Associated Mammals	3
Native Plant Richness	6
Primary Production and Export	N/A


N
Cagey Road
Lummi Shore Road
Bay Shore Drive
38N1E25-02
38N1E25-13
38N1E25-14
38N1E25-05
0
405
810
1,620 Feet